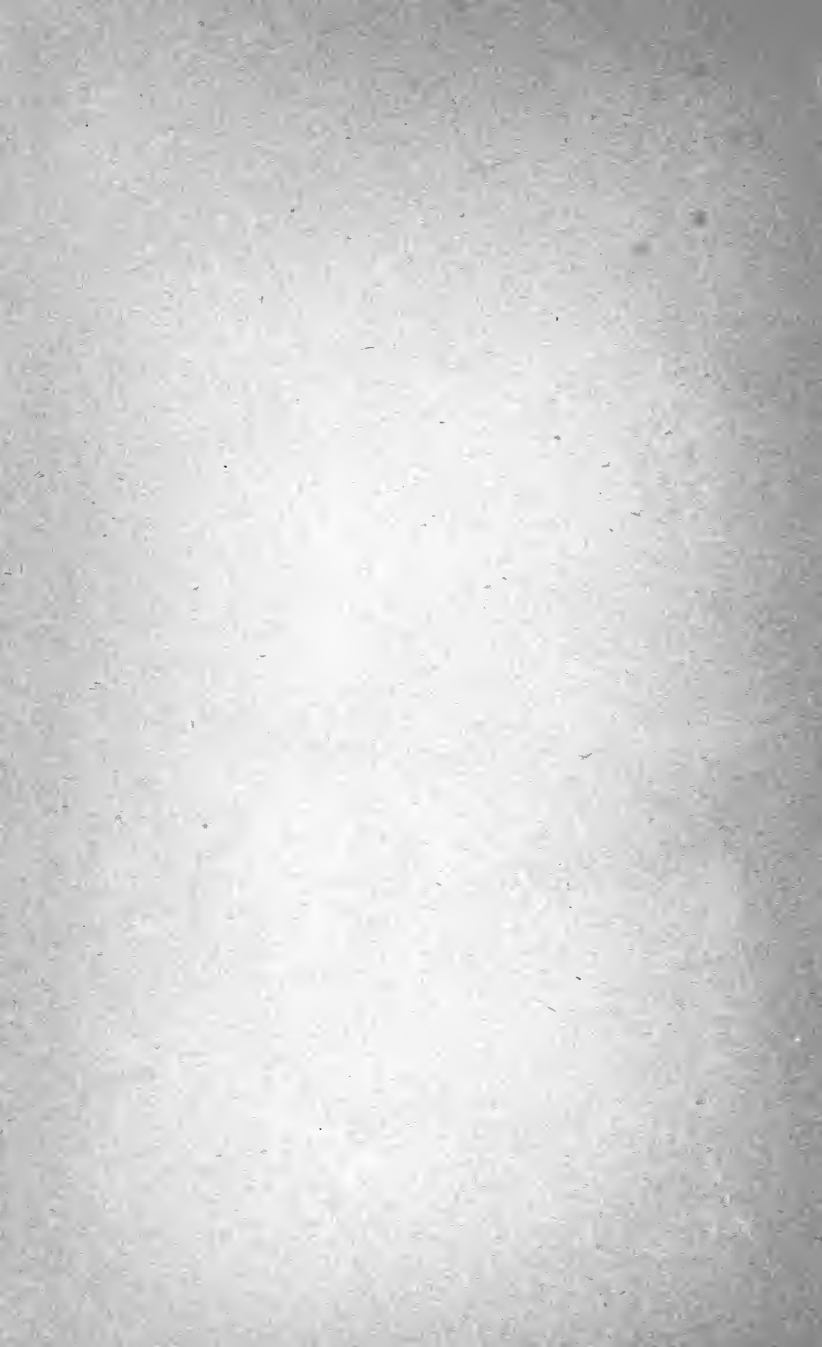


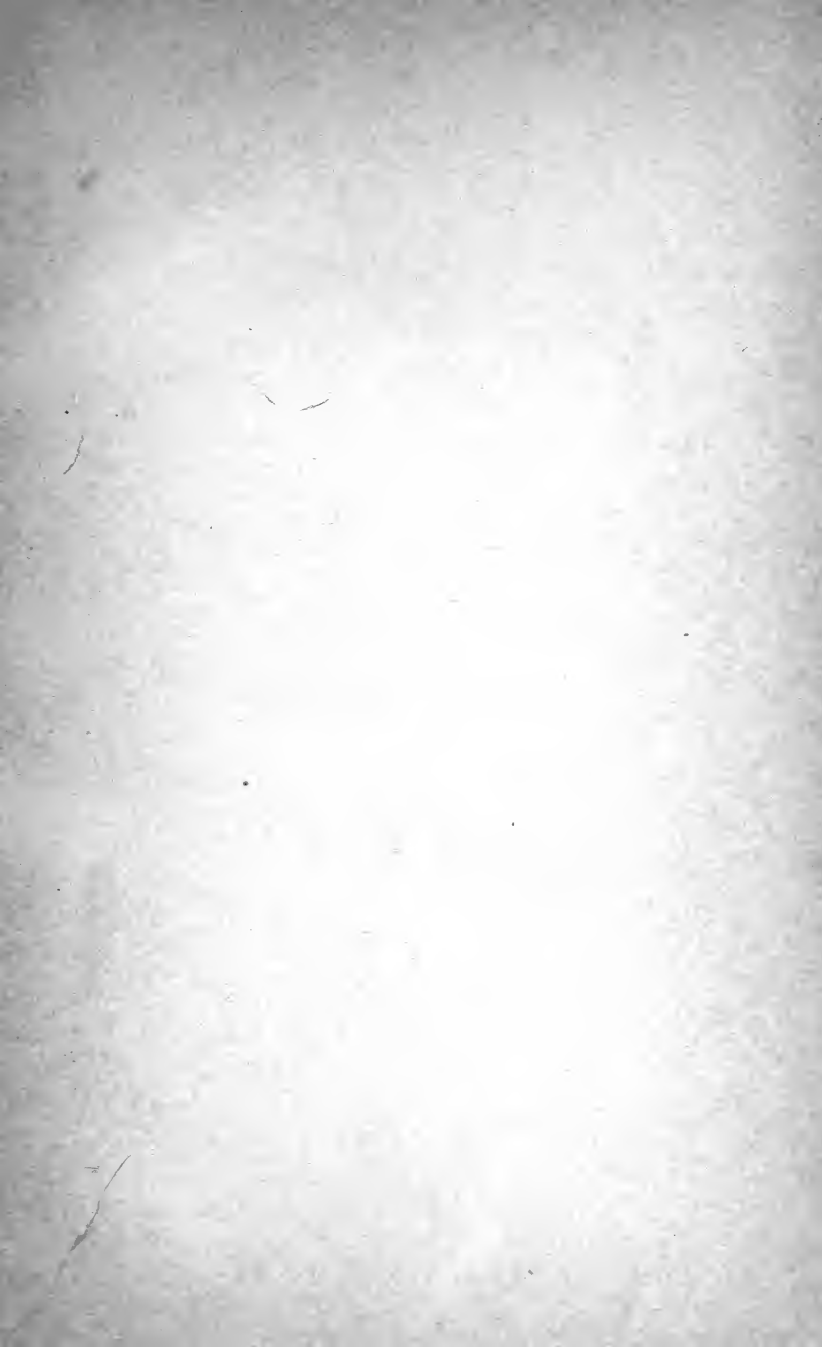
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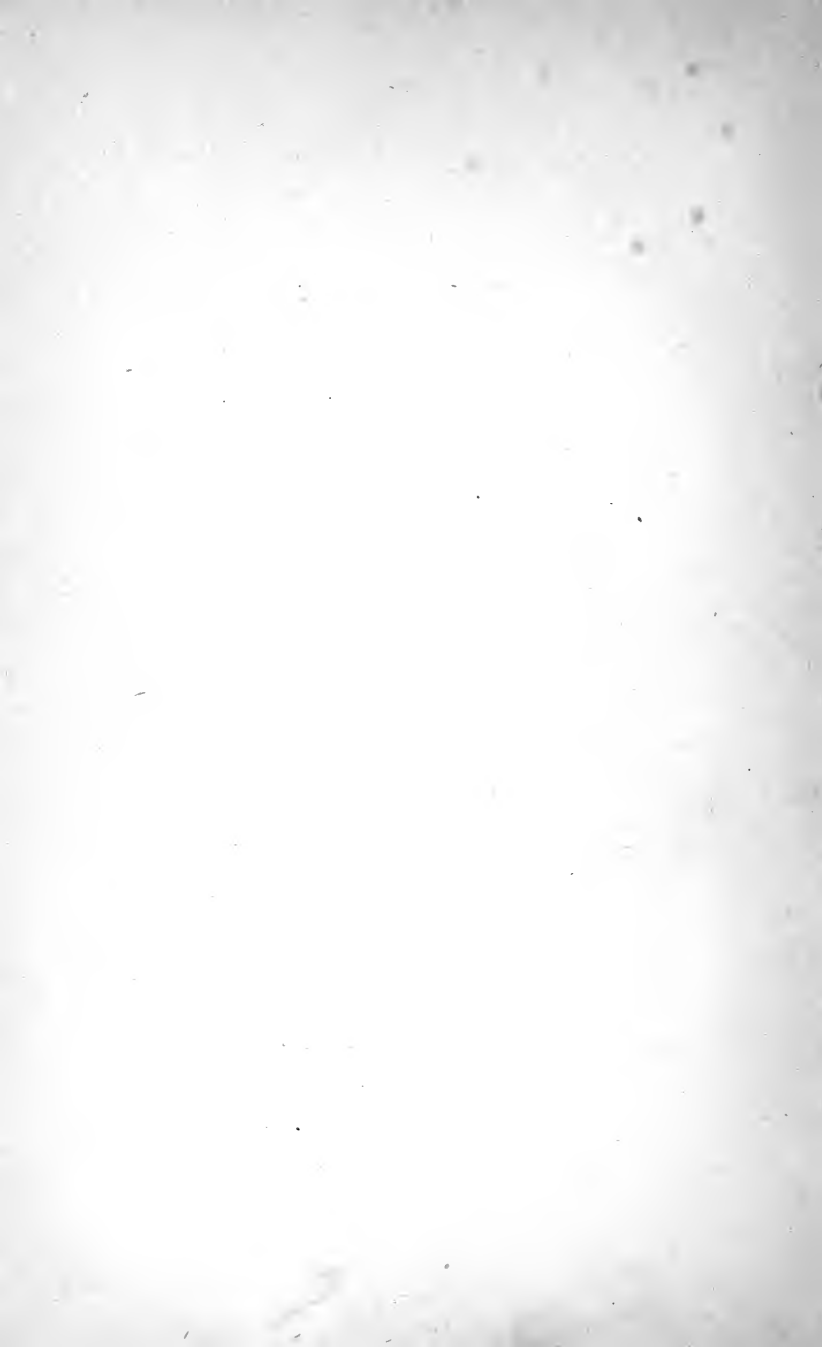
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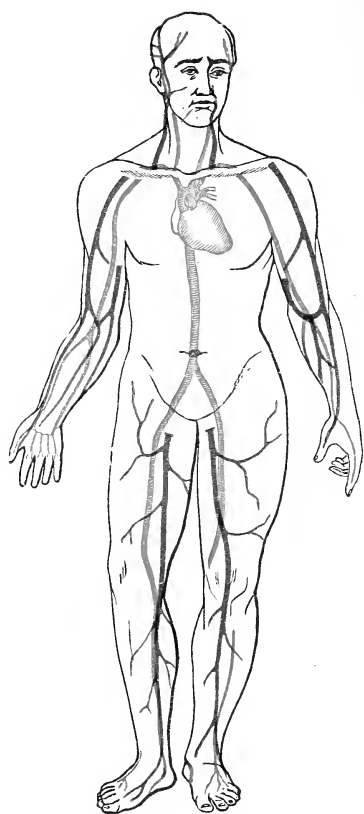
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ACCIDENTS
AND
EMERGENCIES

DULLES



SHOWING THE COURSE OF THE PRINCIPAL BLOOD-VESSELS

ACCIDENTS AND EMERGENCIES

A MANUAL
OF THE TREATMENT OF SURGICAL AND MEDICAL EMER-
GENCIES IN THE ABSENCE OF A PHYSICIAN

BY

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THE PRESBYTERIAN HOSPITAL, IN PHILADELPHIA, AND
ASS'T SURGEON SECOND REGIMENT, N. G. PA.

FIFTH EDITION
THOROUGHLY REVISED AND ENLARGED
With New Illustrations

PHILADELPHIA
P. BLAKISTON, SON & CO.
No. 1012 WALNUT STREET
1897

10295

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1220-24 Sansom Street,
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Preface to Fifth Edition

The exhaustion of four editions of this book and many private communications addressed to the author indicate that it has a distinct field of usefulness. The present edition has been carefully revised, and numerous additions—including a special chapter on Electricity Accidents—have been made without materially increasing its size. New illustrations have been introduced, and a second color has been added to some of the old ones; while a number of valuable suggestions, made by readers of former editions, have been adopted in its preparation.

As in the Preface to the Second Edition, the author would again point out the way in which the book ought to be used. Let it be read over, at least once, as carefully and as studiously as possible, so that the reader may make the acquaintance of its suggestions; and then let it be kept in some handy place, where it can be referred to immediately when

an emergency arises. In order to make it available for sudden necessity, pains have been taken to make the index as complete as possible, and the typography has been so arranged that leading words may catch the eye on every page.

*4101 Walnut Street,
July 1, 1897.*

Preface to First Edition

Whoever has seen how invaluable, in the presence of an accident, is the man or woman with a cool head, a steady hand, and some knowledge of what is best to be done, will not fail to appreciate the desirability of possessing these qualifications. To have them in an emergency, one must acquire them before it arises, and it is with the hope of aiding any who wish to prepare themselves for such demands upon their own resources that the following suggestions have been put together. They are not meant to be elaborate, but simple and practicable. They can not take the place of calling a physician or surgeon, but may fill up with helpful action what might otherwise be a period of inaction and despair, before skilled assistance arrives. With this view I trust they may prove of some value to the public, to whom they are offered.

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ACCIDENTS

AND

EMERGENCIES.

PRELIMINARY REMARKS.

There is nothing so important in the presence of an accident or emergency as that some one with coolness and information enough should assume command and begin to set things aright. Such a one will rarely fail to be recognized by those less efficient, and will usually find little difficulty in so directing them that they shall render some valuable assistance, or at least do no harm to the sufferer. Bystanders should first be urged not to crowd, but to leave room for breathing and action. Any screaming or wailing should be stopped, if possible. Then as many persons as are needed—and no more—should be called on to assist in removing the one in trouble, or, if he be crushed, to remove whatever presses upon him. Next, the injured person should be placed in a comfortable position, lying down, with the head a very

little raised; after which an investigation may be made to find out as nearly as possible what is wrong, so that an intelligent line of subsequent action may be decided upon.

Some one should now be dispatched for a physician or surgeon, with a written message if possible, and certainly with one that shall give a good idea of what he may expect to find when he arrives, so that he may come provided with necessary instruments or remedies.

While awaiting him, whatever may be advisable is to be done by those at hand. Clothing may have to be loosened or removed, efforts at resuscitation may be made, a stretcher or other means of transportation may be provided. Hot or cold applications may be needed, and should be made ready. Temporary splints, or means to control bleeding, may be required. These the bystanders ought at once to attend to. One thing, however, they ought not to do: that is, to give large quantities of whiskey or brandy, as is the almost invariable custom with people who know nothing, but want to do something. If stimulants seem to be called for, the non-medical had better use only hot water, or tea, or coffee, or milk. Alcoholic stimulants, except in small quantities, are, as a rule, not only unnecessary, but actually harmful. They often injure the patient, mislead the doctor, and interfere with the proper treatment of the case.

Exceptions to this general statement may be discovered ; but they are exceptions—this is the rule."

Another important point to be observed is, not to do too much. It will be making a bad use of instructions designed to bridge over the interval between the occurrence of an accident and the coming of one whose whole time is given to the work of healing, if one who knows no more than can be gleaned from a little manual should act as if it had made a surgeon of him. Such presumption might lead to great mortification of the amateur and to great injury of the sufferer. The true principle is, when there is pressing need, to do what is known to be helpful ; and when one is not sure, to do nothing.

Obstructions to Respiration.

Drowning.—It may seem almost absurd to say that the first thing to be done when a person has been exposed to drowning is to remove him from the water. Yet I well remember to have seen, some years ago, the revolting spectacle of a woman's body, fastened with a rope, floating in a river, and gazed at by hundreds of curious people. Upon inquiry, a policeman gravely informed me that no one dared take it out before the arrival of the Coroner. This is a mistake; any one who thinks there is a chance of resuscitation should remove from the water a person presumed to have been drowned, and at once set about the work.*

Treatment.—If natural breathing has ceased, the first thing to be done is to free the body from any clothing which binds the neck, chest, or waist, and to turn it over upon the face for a moment, thrusting a finger into the mouth and sweeping it round, to bring away anything that may have got in or accumulated there. An attempt must be made to

* At the same time, it may be remarked that all efforts to revive an apparently drowned person must be reasonable and gentle. The *Philadelphia Public Ledger* of September 1, 1896, describes a Coroner's inquest in which it was found that the violent measures used to resuscitate a man who had fallen into the river had fractured several ribs. These penetrated the lung and produced hemorrhages, which resulted in death.

restore the breathing if it is suspended or very weak. The most simple and practical mode of producing artificial respiration is that known as Sylvester's method. This is conducted as follows: The body is laid out flat on the back, with something a few inches high under the shoulders (anything will do—a folded blanket, or a shawl, or coat, or stick of wood), so as to cause the neck to be stretched out and the chin to be carried far from the chest. The tongue is drawn well forward out of the mouth and held by an assistant, if there be one present. In doing this the tongue must not be dragged over the lower teeth so violently as to lacerate it. A very good way to get the base of the tongue clear of the windpipe is to press the angles of the jaw strongly forward with both thumbs, applied to them just in front of the lobes of the ears.

Some one now places himself on his knees behind the head, seizes both arms near the elbows, and sweeps them round horizontally, away from the body and over the head until they meet above it; when a good, strong pull is made upon them and

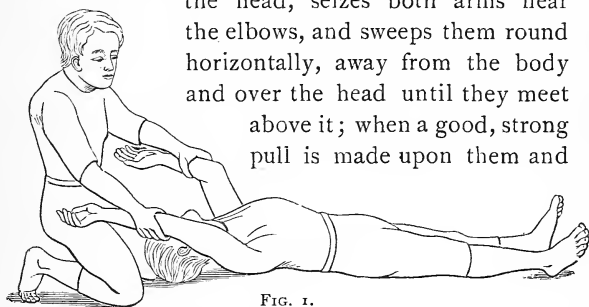


FIG. 1.

kept up for a few seconds. This effects an inspira-

tion—fills the lungs with air—by drawing the chest-wall up and so enlarging the cavity of the chest.

The second manœuvre consists in returning the arms to their former position alongside the chest, and making strong pressure against the lower ribs, so as to drive the air out of the chest and to effect an act of expiration. This need occupy but a second of time.

If this plan is regularly carried out, it will make
about sixteen complete acts
of respiration in a minute. It
should be kept up for a long
time, and not be aban-

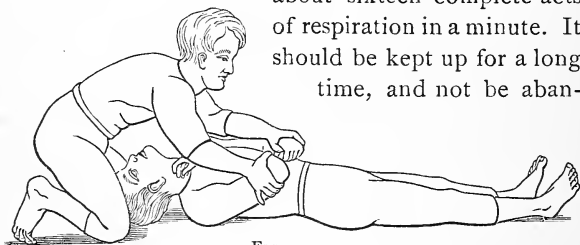


FIG. 2.

doned until a competent person has ascertained that the heart has ceased to beat, or until natural respiration is re-established. The cessation of the pulse at the wrist amounts to nothing as a sign of death. Often life is present when only a most acute and practised ear can detect the sound of the heart. In a moderately thin person, deep pressure with the finger ends just below the lower end of the breast bone may sometimes reveal pulsation in the aorta, the main artery of the body, when it can not be found anywhere else.

In the effort to institute artificial respiration, it is desirable to have the body inclined from the hips downward to the head, if possible; and if a table can be secured the body may be placed on it so that the head hangs over the end, thus elongating the neck; and the legs of the table furthest from the head may be raised as shown in Figs. 3 and 4.

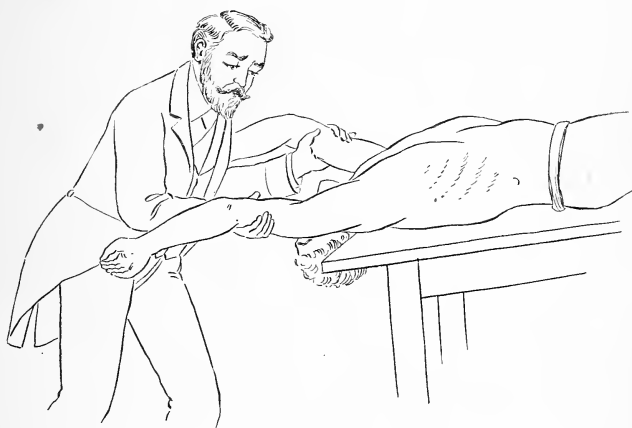


FIG. 3.

Traction of the Tongue.—A method of restoring respiration that sometimes proves successful consists in clearing out the mouth and then taking the end of the tongue in the fingers (a cloth will keep it from slipping), and drawing it fully and strongly forward about sixteen or twenty times a minute, at each time

keeping it drawn out for a second or two, and then letting it go back to its natural position. This method has not proved as useful as was expected when it was first announced, but it has done good in so many cases that it is well worth trying in case there is difficulty in carrying out the method already described as Sylvester's method.

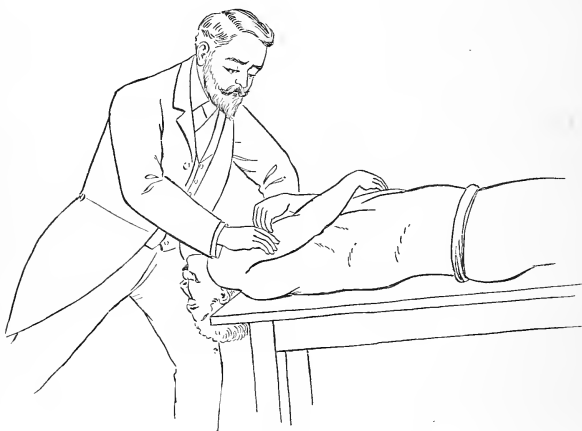


FIG. 4.

It is important that wet clothing shall be removed as soon as possible from a drowned person. This can always be done without interrupting the artificial respiration. If exposure of the person must be avoided, something may be laid over the body (a coat, a shawl, a blanket, a sail) and the wet clothes

may be loosened under it and drawn down over the feet. Then the body may be quickly slipped on to something dry, and covered with some other fabric, if the first has become wet, while this in its turn is pulled away from underneath.

Warmth is to be secured by any means that ingenuity may suggest—hot bottles, or plates, or bricks, or stones, or even boards that have lain in the summer sun. At the seashore there is plenty of hot sand, and often plenty of baking bathing costumes. The body and limbs may be gently, but constantly, rubbed (the rubbing being toward the heart), to help the blood in its labored circulation. None of these things need interfere with the efforts to secure respiration, which must be uninterrupted.

Some stimulant is to be given as soon as it can be swallowed. Teaspoonful doses of whiskey or brandy, in a tablespoonful of hot water, may be given every few minutes until the danger point is passed.

As natural respiration begins to be attempted, it should be aided as much as possible by timing the artificial to it. It may be stimulated by holding smelling salts or hartshorn near the nose,* by slapping the skin, or by dashing *hot* water upon the chest. Where it is available, there is no stimulus to respiration better than that of a good Faradic bat-

* Strong hartshorn should never be brought very close to the nostrils, as it may injure the lining membrane of the nose.

tery, used so as to bring about reflex sobbing, or deep breathing, by the pain it causes.

Success in these efforts is recognized when, little by little, natural breathing takes the place of the artificial; but this must not be left unwatched or unassisted for some time.

Nothing but danger from cold, or pressing necessity, should prompt the removal from one place to another of a person who is being resuscitated, before this has been thoroughly accomplished. If removal can not be avoided, it must be effected with great care. After resuscitation, the person should be put in a warm bed, being carried carefully, with the head low; and a watch should be kept to see that the breathing does not suddenly stop.

Where natural breathing has not ceased, all the steps just described should be carried out, with the exception of artificial respiration. But this should be had recourse to upon the first evidence that natural respiration is failing.

Strangulation, by hanging or by any constriction of the windpipe from the outside, is to be treated by re-establishing the respiration in the same way as for drowning. The obstruction is, of course, to be removed and natural respiration must be stimulated or artificial respiration must be employed.*

* The Philadelphia *Press*, September 19, 1884, published a report from Pittsburg that a man had been found hanging by a clothesline in an out-house of the Crescent Steel Works the day before. He was discovered by

Suffocation with Noxious Gases or Vapors or Smoke calls for instant removal to the fresh air and the establishment of natural respiration, or of artificial until the natural is re-established, as described in speaking of "Drowning" (page 13). Gases like carbonic acid, illuminating gas, the fumes of charcoal, and the collections in mines, wells, or privies, are very dangerous to life. The removal of a person from a well full of a poisonous gas is a very difficult and delicate matter. Some attempt may be made to dislodge or dissipate the gas. Buckets of water may be dashed down, or an open umbrella may be lowered by the handle and rapidly drawn up a number of times. But these efforts must not consume any more time than is required to prepare a man who can be lowered, securely *fastened to the rope*, so that he can attach another rope to the person overcome in the well. The rescuer must be brave, cool, and strong, and those who lower him no less so. He may be somewhat protected by wearing a sack over his head, or having a thick veil or a few folds of a handkerchief over his mouth and nose. But everything will depend upon the rapidity with which he and his comrades can do their work.

Choking is caused by something sticking in the

the watchman, who ran and called a helper; but neither would cut the man down until a physician had pronounced him dead, seeming to have a confused idea that as this is the custom at a public hanging, it ought to be observed at a private one also.

throat, gullet, or windpipe. It is not always easy to tell which of these latter passages is clogged, but usually there is active irritation, with coughing, when a foreign body lodges in the windpipe, while swallowing can be done quite readily. On the other hand, when the gullet is stopped it is usually impossible to swallow, and there is little or no tendency to cough, no matter how much the breathing may be interfered with. About the throat, it is not so hard to tell, for one can usually see or feel with the finger the offending body.

Treatment.—If a foreign body is within reach of two fingers, it may be easy to remove it. If not, a pair of blunt-pointed scissors may be used like forceps. Or a hairpin may be straightened out and one end be bent round so as to make a loop: this to be used in trying to dislodge the foreign body. Or the ring of one blade of a pair of scissors may be used in the same way; or two small spoon-handles may be used like tongs to draw the foreign body out. It has been asserted that, for obstructions in the throat, such as pieces of meat, a simple mode of relief is to blow forcibly into the ear. This sometimes excites powerful reflex action, during which the foreign body is expelled. Such a plan is so easy of execution that it is certainly worth trying.

Children not infrequently get buttons or coins or marbles in their throats, and come near choking to death. These may often be pulled out, or expelled

by vomiting, if this can be provoked. Holding the body up by the legs, with the head hanging down, has sometimes aided other efforts to get rid of such things. The responsibility of attempts to push them down may well be left to a surgeon.

If pins or needles or fish bones get stuck in the mouth or throat, it is sometimes an extremely delicate matter to remove them. Sometimes, on the other hand, they may be grasped with the fingers or a pair of blunt-pointed scissors—used like forceps—and pulled out. If this cannot be done, the patient should be made to lie down, and kept as quiet as possible in body and mind until some one comes who can give relief.

If foreign bodies get into the windpipe they will soon be coughed out, or require surgical skill for their removal. A moderate blow on the back with the open hand, or a quick, strong squeeze of the chest, sometimes aids the coughing act; and inverting the body may assist in dislodging the foreign body if it be not too tightly wedged in.

In any case in which the breathing is not seriously interfered with, it will be most prudent for non-medical persons to keep “hands off.” For there may no longer be anything in the throat, though it appears there is; and it can do no good to make groping efforts to bring away foreign substances that have already gone down into the stomach, only

leaving behind an irritation that deceives the patient and his friends.

When strange things, like coins or marbles or slate-pencils or nails, are swallowed, it is a mistake to give a purgative. The proper plan is to let the bowels alone and to give for a day or two plenty of good, solid food, especially vegetables, like potatoes, or cornmeal mush, so that the foreign body may be surrounded with the waste and carried out of the body without injuring the wall of the intestines.

Foreign Bodies in the Eye, Nose, and Ear.

Foreign Bodies in the Eye.—Small substances, like cinders, dust, or small chips of stone or metal, can usually be removed from the eye by very simple means. Sometimes there is at once a free flow of tears, that washes them out. At others, the common way of catching the upper lid by the lashes and pulling it away from the eyeball and down over the lower lid, then letting it go, so that as it recedes its under surface is swept by the lashes of the lower lid, will clear the eye.

If this does not prove successful, a loop made of a horse hair, or a long human hair, can be passed under the lid and swept from the outer side toward the nose and drawn down. This may serve the purpose. If it does not, the lids must be everted, or turned inside out. With the lower lid this is easy to do; with the upper lid it is sometimes difficult. The best way is to seize the lashes between the thumb and first finger, and to draw the edge of the lid away from the eyeball. At the same moment the end of the second finger is pressed against the skin of the

lid above its edge. The patient is now told to look down, and as he does so the lashes and edge of the lid are pulled upward toward the eyebrow, while the

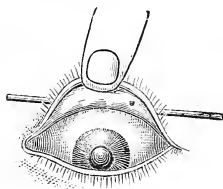


FIG. 5.

upper part is tucked under it with the end of the second finger. Another plan is to draw the lid down; to take a slender pencil or a knitting or crochet needle, and place it against the eyelid, parallel to and $\frac{1}{3}$ of an inch above the edge, and then to pull the

edge up and turn it back over this by means of the lashes.

In this way a large part of the eyeball and eyelid can be examined and any foreign substance can be removed. A magnifying glass and a very good light are sometimes needed in order to see fragments that have given a great deal of trouble.

One must be on his guard against the sensation that is sometimes left after a foreign body has been removed from the eye. It often feels to the sufferer as though this were still in his eye when it is not. But a most careful search should be made before this is taken to be a self-deception; and even then it would be better to consult a more skilled person.

After removing a foreign body from the eye, the irritation may be sufficient to demand cool, wet applications, or even anodynes. Nothing is better than

a thin mucilage of pure, clean gum-arabic and water, poured freely into the eye. Or, a little laudanum may be poured into a heated cup, and when evaporated to a kind of jelly it may be thinned out with clear water and then poured into the eye. A bandage, loosely applied, so as to shut out light and keep the eyeball rather quiet, often does much good.

If removal of a foreign body proves difficult or impossible, it is usually very soothing to put a drop or two of fresh olive oil or castor oil into the eye.

When *lime* gets in the eye it burns very severely. For this the eye should be at once deluged with water, and a little vinegar or lemon juice and water (a teaspoonful of vinegar or lemon juice to a teacupful of water) should be poured over the eyeball.

Foreign Bodies in the Nose.—Children sometimes place, or have placed, in their noses small bodies, such as marbles, buttons, peas, beans, or small grains. To get rid of them, the nose should be blown hard ; or, sneezing may be excited by tickling the nose or giving snuff ; or, the child may be told to take a full breath and then be given a smart blow on the back. Some one of these plans may dislodge the foreign body. If it does not, it is best to abstain from efforts to fish it out, for such efforts may do much damage, while the presence of a foreign body in the nose is ordinarily neither dangerous nor very annoying. When simple efforts to remove a foreign body from the nose are unsuccessful a surgeon must

be called, and the sooner it is done the better. The longer it is delayed, the harder will be his work, and the worse for the child. In case peas or beans are lodged in the nose, the danger is increased by the fact that if they absorb moisture they swell, and may then be very difficult to get away.

Foreign Bodies in the Ear.—The removal of foreign bodies from the ear is sometimes very difficult, because there is no way of getting at them from behind, and there is no natural force to be called to one's assistance. Consequently it usually requires special instruments and unusual skill. Yet, if no medical man be obtainable, and if it be remembered that the outer passage of the ear is only about an inch deep and very delicate, something may be done.

If the body be a metal or mineral one, the ear may be syringed out thoroughly with warm water. In doing this, the ear should be gently pulled upward and backward, the point of the syringe being placed in the upper part of the external canal, so that the stream of water can get behind the object and sweep it out. *Exceedingly gentle* efforts may even be made to remove a foreign body with a crochet needle, or a hairpin, or an ear spoon, if it can be had. But with all these it must be remembered that irreparable damage may be done by the least roughness or the least slip. The syringe should not be used if the foreign body is a pea or bean ; for water will make

either of these swell, so as to be harder to remove. *It should be remembered, also, that there is generally no danger in letting alone a foreign body in the ear. Most foreign bodies are far less dangerous than the efforts made to remove them.*

If live insects get into the ear, oil or glycerine or salt and water (a teaspoonful to a half pint) should be poured in. After about half an hour the ear may be syringed in the manner already described. An ingenious method, which has sometimes been successful, is to turn the ear at once to a bright light, so as to tempt the insect to back out, on account of the attraction that light has for all these creatures.

Unconsciousness or Insensibility.

Unconsciousness, or Insensibility, occurs in many different conditions, and it is of great importance that something should be known about them by railway officials and railway servants, manufacturers, superintendents of mines and public works, surveyors, constructors, keepers of hotels, and schoolmasters, and policemen. The former might often do priceless service to those who come under their care, and the last might escape much blame and avoid some unfortunate mistakes, if they could always distinguish disease from disorder and drunkenness.

This, it must be acknowledged, is often hard to do. But so much the more reason is there for attempting to learn enough to prevent such shameful mistakes as are sometimes made. So, before describing the treatment of conditions in which unconsciousness may be present, a little space may be devoted to considering, in a general way, how one may decide what unconsciousness is due to.

For our present purpose the cause of unconscious-

ness may be classified as: disorders of the circulation, disorders of the brain, poisoning, and intoxication.

Unconsciousness due to Disorder of the Circulation, or temporary failure of the heart, is familiarly illustrated in fainting. This may be brought about by a simple nervous influence, or by a sudden shock, or by loss of blood. In any case, the condition is easily recognized by itself or from its cause. The loss of consciousness is accompanied by paleness of the lips and face, and usually by coldness of the extremities, with more or less appearance of perspiration.

Unconsciousness due to Disorder of the Brain may be caused by disease or injury. Disease of the brain is usually marked by a gradual approach; and what physicians call the "history" of the case clears up this point. On the other hand, injuries of the brain are usually accompanied by external signs, such as dirt, swelling, bruises, or cuts, indicating that violence has been inflicted; or, they occur under circumstances that make a suspicion of violence reasonable. In apoplexies, some of the external evidences might prove misleading; but besides these there is often found an unequal enlargement of the pupils, and paralysis on one side of the face and body. In the unconsciousness of epileptic convulsions there is usually little trouble in deciding what is present, from the frothing and biting of the tongue

or lips, and the peculiar cry before unconsciousness sets in, with which every one is familiar.

Unconsciousness due to Poison may be caused by a poison generated within the body. An example of this sometimes occurs in serious kidney disease. In such cases there are usually convulsions or twitching of the muscles, and often a dropsical appearance about the eyes and legs, with delirium or profound stupor, and a smell like that of stale urine about the person affected.

The cause of poisoning by gases is generally easy to detect by the aid of surrounding circumstances.

The only insensibility due to drugs that is likely to be confused with intoxication is that caused by opium or chloral. But in this the pupils are strongly and rigidly contracted—the very opposite to what is seen in drunkenness.

Unconsciousness due to Intoxication is marked by many signs of other insensibilities ; but it has these peculiarities : usually the face is flushed and the body is relaxed everywhere ; the person may be roused by loud cries ; both pupils are dilated ; and a distinct odor of liquor may be discovered.

When a doubtful case arises, the first thing to be done is to see if the odor of liquor can be detected. If not, one may be quite sure he is not dealing with a case of intoxication. But, on the other hand, if the odor is present, one must not conclude at once that the case is one of simple drunkenness. For it often

happens that liquor is given after an accident ; and an accident may have happened to a man who had been drinking. To avoid mistake :

1. *The head must be examined.* If there is a cut or a bruise, it is prudent to assume that there is a brain injury, received before or after the liquor was taken.

2. *The eyes must be examined.* If the pupils are permanently contracted and do not dilate when the eyes are shaded, the case is probably one of brain disease or opium poisoning. If one pupil is contracted and the other is dilated, it is a case of injury or disease of the brain.

3. *The face must be examined.* If it is drawn and wrinkled on one side, and smooth on the other, the case is probably one of apoplexy, or obstruction of a blood vessel in the brain, or pressure upon some part of the brain.

4. *The mouth must be examined.* If it be frothy, and if the tongue or the lip be bitten, the patient's condition is probably due to epilepsy or some other convulsive disorder—not simply to intoxication. Of course, it must be borne in mind that the tongue may be bitten accidentally by being caught between the teeth in a fall.

5. *The arms and legs must be examined.* If one is stiff and one is limber, or if one moves when pinched and the other does not, the patient has one-sided paralysis, or hysterics. If the latter, the person

affected will usually resist any attempt that may be made to open the eyelids; and when the eyelids are forcibly opened the eyeballs will usually be found persistently rolled up; which may be regarded as an almost infallible evidence of hysterics. At the same time close watching will generally lead to the discovery of some sign that the affected person is listening to what is being said about him or her.

6. *The temperature of the skin must be investigated.* If the skin be burning hot and dry, sunstroke or heatstroke may be suspected, if the time of year or the occupation of the patient warrant such a conclusion. If the skin be cold and clammy, the case may be one of heat exhaustion.

After all these tests have been applied, there will still be a few cases in which it will be hard to say (in the presence of an odor of alcoholic liquor) whether there is, or is not, some trouble more serious than mere drunkenness present. In these few cases the only safe course is to take it for granted that there is some other trouble present—even if there be intoxication too—though it be at the risk of being sometimes deceived and imposed upon. This is of especial importance in the case of persons under arrest; for many such persons have lost their lives because it was taken for granted that they were only “drunk,” while in fact they were ill or injured—with or without being drunk also. When there is any

doubt the person should be transported and treated with great care, an attempt being made to discover what disease or injury, alone or combined with intoxication, has produced the condition in which he has been found. *Such a person should never be made to walk to a station house or be confined alone*, or be permitted to escape the vigilance of those who take charge of him, until they can rest the responsibility of his fate on others better instructed or in authority over them.

Treatment.—The treatment suitable for all cases in which there is doubt as to the cause of unconsciousness is to secure quiet and rest, the body being laid upon the back, with the head a little raised. If there be great paleness and a cold surface, with slow, sighing breathing—the signs of prostration—smelling salts or hartshorn may be held under the nose, and hot tea or coffee may be given, while heat is applied to the body. If there be great heat of the surface, cold may be applied to the body and head, and cold drinks may be given. One precaution must always be taken in giving fluids to more or less unconscious persons, namely, to see that the fluids are swallowed, and not taken into the lungs. Even in general unconsciousness, swallowing is usually effected as soon as a fluid reaches the back of the tongue; but fluids have entered the windpipe when given by the mouth. If such an accident should

occur, it would at once produce violent coughing ; and this would give warning to stop the administration of the liquid.

With these general remarks on the way to decide between simple intoxication and other causes of loss of consciousness, let us now consider separately the way in which different cases should be managed. x

Fits or Seizures.

Fainting is too familiar to need much detail of its symptoms. It is due to a temporary weakening or pause in the heart's action, causing a diminution or suspension of the circulation of blood in the brain, and a consequent loss of consciousness. This is accompanied by a loss of muscular power, so that the individual, if standing, falls. The pallor of the skin in fainting is very well known, and is simply a signal of the like bloodlessness which obtains in the brain itself.

Treatment.—Usually no treatment is demanded in fainting; for a wise provision of nature puts the person who faints in the best position for recovery, that is, lying down. But if in any way this is prevented from happening of itself, it should be brought about by a bystander. A fainting person must be laid out flat at once. The head must be put as low as, or lower than, the body, so that the heart may not have to work against the force of gravitation in sending blood to the brain; and heavy wraps, tight collars, corsets or waist bands should be loosened or removed. Sprinkling water upon the face and hold-

ing smelling salts or spirits of camphor to the nose, tend to excite the nerves of sensation and rouse the brain and heart to renewed activity. In using strong salts or hartshorn, care must be taken not to scald the nose of the patient by holding either too close or using it too long. Simple and gentle stimulation is usually sufficient to bring a person out of a faint; and if one should be very slow in reviving, it might be well to apply heat to the pit of the stomach. But the first, the indispensable thing is to lay the fainting person down flat. Nothing should be allowed to interfere with this. After a fainting fit, half a teaspoonful of aromatic spirits of ammonia with a tablespoonful of water, or a small quantity of an alcoholic stimulant (wine or whiskey) may be useful. The latter is best given with a moderate quantity of hot water.

Hysterics.—Fits of hysterics, marked by prolonged and uncontrollable laughing or crying, are best treated by the exercise of calmness and patience on the part of the bystanders, sometimes by taking no notice of the attack, or by leaving the unfortunate sufferer in a room by herself or himself—for men are at times subject to this curious disorder. Heroic measures, like dashing water into the face, are not to be generally recommended. Good is sometimes done by giving teaspoonful doses of valerian or Hoffmann's anodyne, if it can be obtained. A rather disagreeable but efficient remedy is an emetic. It

should be used only in cases in which the treatment is meant to be a punishment.

In Epileptic Fits the sufferer usually has a warning sensation, and often starts up to leave the place he is in. There is in the attack, pallor or lividity of the face, a peculiar cry, loss of consciousness, a moment of rigidity, and then the face becomes congested, and more or less violent convulsions come on. In these there is usually some foaming at the mouth, the eyes roll or are turned up, and often the tongue or lips are bitten.

Treatment.—Epileptic fits are to be treated very much like fainting fits, because in them also the brain is temporarily bloodless. At the same time any movements calculated to injure the person must be controlled. There is no use in struggling against such movements as will do no injury ; they had better be simply regulated, and no attempt need be made to entirely prevent them ; but a folded towel or a piece of soft wood may be—if it can be—thrust between the teeth, to prevent the usual biting of the tongue. In doing this the helper must look out for his own fingers, lest they be bitten. When the height of the convulsion is passed, rest, quiet, and perhaps moderate stimulation may be secured. Here, again, as in fainting, the flat position of the body must be obtained ; and very moderate stimulation may occasionally be useful after consciousness is restored.

I saw, one summer, at the seashore, some ill-advised,

though kind-hearted, persons walking a boy up and down the beach during an epileptic attack, because, from his pallid face, they thought he was suffering from the cold ; and they were much astonished at the rapidity with which he regained entire consciousness when laid out flat on the sand.

It would be a good plan if every one who is subject to epileptic attacks had his, or her, name and address sewed just inside the coat, or in some place where it could be seen at once when the clothing is loosened to give relief, as is almost invariably done when such attacks occur. Epileptics should not, except when it is absolutely unavoidable, go about alone, or go into crowded places. They have no right, on their own account and for the sake of others, to incur the risks involved in such conduct, except under the stress of necessity.

Convulsions of Children and Infants are generally (in the absence of brain or kidney disease) due to some irritation of the digestive apparatus or to teething. They are usually preceded by some other evidence of irritation, such as restlessness and fretfulness. When they come on, there is a loss of consciousness, and spasms. These may affect the whole body at once, or only a half, or only one limb at a time. The eyeballs sometimes roll about, or they squint, or they are turned far up, so that only the lower part of them can be seen.

Treatment.—When convulsions occur, the child

should have cold applied to the head and heat to the body. It often does good to place it in a tub of hot water to which some mustard has been added.

A large injection of hot soap-suds may also be given, to clear the bowels out, and, if possible, an emetic should be given, in the hope of removing some cause of trouble from the stomach. This should be followed by a dose of castor oil.

Apoplexy consists in the rupture of a blood-vessel in the brain, and is marked by a slow pulse, more or less sudden loss of consciousness, stupor, heavy snoring breathing, in which one cheek is sometimes puffed out with each outgoing breath, and usually a deeply flushed face. The pupils are generally dilated. Paralysis may be observed at once, or it may appear after some time. Usually it is limited to one side, and it may be detected by observing that one side of the face is drawn up, while the other looks flabby, and the corner of the mouth on that side hangs down a little. The flabby side is paralyzed, not the drawn one, as is sometimes supposed.*

Treatment.—For this condition, rest and cold to the head constitute the best treatment until medical advice—which is indispensable—can be obtained. If this can not be had for some time, the bowels

* There is a very rare form of apoplexy, called "pons apoplexy," in which the pupils are contracted, and there are some other signs of opium poisoning. But it may be practically excluded from the diagnosis.

should be emptied, if possible, with an injection of hot soap-suds; and a purgative, like castor oil or Epsom or Rochelle salts, should be given by the mouth as soon as it can be swallowed.

Intoxication sometimes closely resembles apoplexy, and should be treated in the same way until its identity can be easily established. For this the odor of the breath is a useful guide, though it should never be forgotten that the odor of liquor may be due to a stimulant given after an accident, or taken just before one. In addition, it may be remembered that in a case of deep drunkenness there is no paralysis though there is helplessness equally on both sides, that the person can be aroused from the stupor, and that generally if the eyeball be touched with the finger he will attempt to close the eyelids.

Treatment.—In a case of profound intoxication an emetic should be given, and, if any hartshorn or aromatic spirits of ammonia is at hand, a teaspoonful of this in a teacupful of water. A large draught of vinegar will often go a great way toward sobering an intoxicated person. If there is much evidence of prostration, with cold, clammy skin, heat will have to be applied to the body to prevent collapse.

Emetics are sometimes of value in cases of profound intoxication; but it must be borne in mind that, if a mistake be made—as has been—and the trouble be an apoplexy, no more dangerous thing could be done than to give an emetic.

Catalepsy is a very rare state, somewhat resembling death, marked by more or less pallor of the skin, rigidity of the muscles, and apparent unconsciousness. In itself it is not at all dangerous, and it affords time enough to summon a doctor; which should always be done. ♦

Sunstroke produces a form of unconsciousness which will be considered under the head of “Effects of Heat.”

Injuries to the Brain.

Concussion of the Brain, or stunning, may be caused by blows or falls on the head, or even by falls upon the feet. In such cases there is sickness, sometimes fainting, with paleness and depression. There is also usually confusion of ideas, and the sufferer can not talk continuously or coherently. There may even be unconsciousness.

Treatment.—The proper treatment for this condition is to lay the sufferer out flat on the back, to loosen any clothing that binds his neck or waist, and to secure quiet and plenty of fresh air. If the skin becomes cold and clammy, heat should be applied to the body and limbs. No whiskey or brandy should be given.

Compression of the Brain.—This is caused by the pressure of broken bone upon the brain after a fracture of the skull, or by the pressure of blood poured out by a hemorrhage inside the skull. The symptoms are loss of consciousness, sometimes paralysis, sometimes twitching of the muscles, or even convulsions, and usually heavy, snoring breathing, with wide dilatation of one or both pupils.

The treatment is the same as that for apoplexy. (See p. 39.)

Effects of Heat.

Burns or Scalds are usually dangerous in proportion to their extent, rather than to their depth. Those which involve as much as half the surface of the skin are almost necessarily fatal.

The treatment of burns may be considered under two heads. The first is for the moment of the accident. When clothes are on fire the wearer must not run about, but lie down and be covered with a rug or blanket or carpet or shawl or coat—any woollen thing (not cotton or linen, for these take fire too easily) that will exclude the air and smother the flame. It is especially important to keep flames from the face, if possible. If, in fright, the sufferer lose presence of mind, some bystander must take the responsibility of throwing her (for these accidents usually happen to women, on account of the character of their clothing) down and enveloping her with some thick cover.

After an extensive Burn or Scald, so much of the clothing as has to be removed must be clipped away (using sharp scissors), so as not to burst blisters that have formed. These may be punctured at one edge so as to allow their contents to run out, and the

elevated cuticle, or outer skin, to fall down upon the deeper layer. Then a dressing of pure sweet oil, or castor oil, or any oily substance free from salt, like vaseline or new-washed lard, should be applied on strips of soft old linen, and disturbed as little as possible afterward. It is customary in hospitals to clip away the clothing and envelop the patient in lint soaked in "carron oil" (which is a mixture of equal parts of linseed oil and lime-water*), and to administer stimulants and anodynes. In case of a person severely and extensively burned, the entire body may be immersed in a bath, kept at a temperature of 100°. When the shock of a burn is great, moderate quantities of some stimulant should be given, and laudanum, in thirty-drop doses to an adult, and half as much to a child, may be used to allay suffering. The amount of pain in very extensive burns is often less than generally supposed. Those who see many cases of severe burns know that there is usually not much pain in fatal cases; in fact, the absence of pain sometimes leads the friends to indulge in false hopes of the patient's recovery.

Slight Scalds or Burns are best treated by applying a cloth soaked in a solution of baking soda (the

* To make lime-water, put a piece of unslacked lime the size of a very large walnut into a bottle containing a pint or two of cold water, shake it up a few times, then let it settle. One need not fear making it too strong; the water will take up only a certain quantity of the lime, however much is put into it.

bicarbonate) in the proportion of a heaping tablespoonful in a pint of water; or the soda may be powdered on without using any water. This usually allays the pain more effectually than anything else that is known. Carron oil is a good application for such burns. So is the white of egg; and in an emergency damp earth might be used, or soapy water, or white lead paint. A good application for burns may be made of strips of linen or muslin soaked in a mixture of a teaspoonful of carbolic acid, two tablespoonfuls of glycerine, and a pint of olive oil, or in carbolized vaseline, obtained at a drug store. Anything may be used which will prevent friction and exclude the air; but nothing should be used which will stick in cakes and prevent after-examination, or make this very painful. For this reason flour and cotton-batting, though often recommended, had better not be used. For most burns, simple cool water is better in every way than these. Indeed, for any but the most extensive burns it is one of the best remedies. An arm or a leg can be immersed in it and left there a long while with great advantage.

Burns with Acids must be deluged with water and then treated like other burns.*

Burns with Caustic Alkalies, such as soap-lye, should be treated with an application of vinegar, followed by applications of oil.*

* For the treatment of cases in which acids or alkalies are taken into the mouth or swallowed, see under "Poisons."

Burns with Hot Pitch.—After such burns the pitch often sticks. In such a case it ought not to be removed, but should be let alone until it is coming off of itself.

Sunburn, and the burns caused by external applications, like mustard or Spanish flies, may be treated very successfully with baking soda. This may also be mixed with vaseline, or cosmoline, or lard from which the salt has been boiled out, the mixture being used as an ointment.

Sunstroke, or more properly **Heatstroke**, is not usually due to the direct rays of the sun, but rather to a prolonged elevation of the temperature of the body, oftenest while one is working, especially in a confined place. When it takes place in the open air it is likely to occur on an oppressive, heavy, or murky day. The attack is generally preceded for some time by pain in the head and a sense of oppression. It culminates in a loss of consciousness, with heavy, labored breathing, and an intense, burning, dry heat of the skin, while the bladder and bowels are often involuntarily evacuated. The absence of perspiration in the presence of so great heat is one of the most characteristic symptoms of heatstroke.

Treatment.—The treatment of heatstroke consists in lowering the temperature. As much of the clothing as possible must be removed, and the patient must be transported to a cool and airy place. Cold must then be applied to the head and body in the

form of cold water or ice rubbed over the chest and placed in the armpits.

Pouring, or dashing, cold water over the body is not to be advised, as it conveys a needless shock to the system ; but there is nothing better than to place the sufferer in a cold bath, or to wrap him in sheets kept wet and cold by renewed applications of cold water or ice. After a while consciousness will return. Then the cold may be discontinued, to be renewed only if the surface becomes again very hot—that is, hot in contrast to that of a well person, not in contrast to the ice or water that has been used—or in case consciousness should be lost again.

Sunstroke, or heatstroke, is very dangerous, and may be followed by grave and permanent impairment of the intellect.

Heat Exhaustion.—This is a condition of great depression of the system due to the action of heat. As it occurs in hot weather, it may be confounded with sunstroke or heatstroke. But in heat exhaustion, instead of a hot, dry skin, there is a cold, moist one.

Treatment.—Heat exhaustion must be treated with rest and fresh air, in a cool apartment ; but there must be no application of cold to the surface. Small doses of whiskey or brandy, thoroughly diluted, may be given, so that the system may be gradually brought back from its depression.

Effects of Cold.

Frost-bite sometimes takes place in so insidious a way that the sufferer is not aware of it until great damage has been done. Toes are perhaps oftenest frozen or frost-bitten in this part of the world, partly because of the practice of wearing tight and insufficient coverings on the feet. Freezing of fingers, ears or noses is of less frequent occurrence, but it is common enough.

Treatment.—All forms of frost-bite or local freezing are to be treated in the same way, which consists in gradually bringing the temperature up to the normal point (about 99° Fahrenheit) and maintaining it there. For this purpose moderate friction may be used, or soaking in moderate hot water or with hot, wet cloths. Rubbing with snow is used in certain countries where snow is plenty and the custom is well established; but warmth is what is needed, and there is no virtue in the cold of the snow—the rubbing does the good. The practice of soaking frosted feet in ice-water will soon be abandoned by any one who gives a fair trial to warm water.

Freezing.—If the whole body has been long exposed to extreme cold, there will follow a depression

of vitality which requires the most cautious treatment. To restore the sufferer, restoration of his bodily warmth is indispensable. This may be effected by immersing him in a warm bath, which should be made gradually warmer until it is as hot as can be well borne. Surrounding the patient with heated blankets, or exposure before an open fire, may be used if the bath is not conveniently obtainable.* At the same time stimulants in moderate quantity, such as hot tea or coffee, may be given internally with the addition of small quantities of spirits.

* This recommendation is contrary to popular belief and contrary to what is taught in most text-books, as well as in books on the treatment of emergencies. But it is correct, as has been repeatedly and abundantly shown by experience in this country and by experiments made in Russia, where it was found that the best way to resuscitate dogs which had been frozen was to put them at once into a hot bath. In one set of experiments, of twenty animals treated by the "gradual" method in a cold room, fourteen died; of twenty introduced at once into a warm room, eight died; of twenty placed immediately in a hot bath, *all recovered*.

Electricity Accidents.

The passage of a powerful current of electricity through the body may cause a dangerous form of shock or even death. When such an accident occurs, the first thing to do is, of course, to release the injured person from the current, if this is still acting upon him.

To do this without danger, the rescuer must avoid making himself the line of passage for the current. So he must not touch with any part of his body a live wire or a lamp or generator or transformer, while another part of his body is in electrical contact with the ground, either directly or by means of a moist or a metal surface. He should never take the risk of touching a live wire with both hands at once; and it is well not to permit any two parts of the body to come at the same time into contact with a live wire or any electrical apparatus. If possible, a rescuer should be insulated by having a good non-conductor under his feet and another to protect his hands. Fair insulation is secured by wearing rubber shoes or boots and rubber gloves; and a person well insulated may handle a live wire with com-

parative impunity, provided it does not come into contact with any unprotected part of his body.

Besides rubber there are several insulating materials that will serve quite well in an emergency. Of these may be mentioned, for the feet, a dry board, and for feet or hands, a number of folds of cotton or woolen cloth or of paper. Silk also is a good insulator. In case of accident a quick-witted helper may stand upon a board, or a book, or a coat, if he has no rubber shoes, and may then move a wire with a hand protected with a thick, dry, cotton or woolen glove or with another dry garment. In cutting a wire, the feet should be insulated if possible ; but if they are not, there will be little danger if the hands are protected as just described, and if an axe or a hatchet with a dry wooden handle is used.

Electricity accidents do not admit of wasting time in hunting up what is needed ; and the best helper will be the one who finds in his pocket, or on his back, some good insulating materials, and who puts them in use immediately.

After a live wire is cut, it will be well, if there is time, to wrap its end with a piece of cloth, or to put it into a rubber boot, so that it shall not keep up an alarming running fire on the ground, or on a metal roof, or do injury to a new victim.

When a person who has received a severe shock has been released from the current, he should be

laid down in a safe place, his clothing should be loosened, and he should have plenty of fresh air and bodily rest. Medicines are not of much use, but the body must be kept comfortably warm, and if the breathing is suspended or feeble, artificial respiration may be set up in the manner described in speaking of "Drowning." (See p. 13.) The mouth will not have to be cleared as in drowning accidents, but care must be taken that the tongue does not fall back in the mouth, so that its base shall close the breathing passages.

If these suggestions are followed, any one who has not received a shock instantly fatal may be expected to recover. Complete recovery may take some time ; but the beginning of recovery will not be long delayed.

Lightning Stroke.—The effect of a stroke of lightning is like that of a violent shock of any kind of electricity. There may be instant death, or unconsciousness with great depression of the circulation or respiration. The treatment for this condition is the same as that just described, namely, rest, fresh air, warmth to the body, possibly stimulation, moderate and artificial respiration if necessary.

Burns caused by electricity (artificial or lightning) must be treated as described under the head of "Burns."

Sprains.

Sprains are sometimes quite trifling injuries, and require no treatment but a little rubbing or a little rest. At other times sprains are more serious and require as careful treatment as fractures do. In all forms of sprain, rest is the most important thing to be secured until a surgeon comes, and next in value is moist heat.

To secure rest, a bandage will sometimes suffice, but a splint may be required. The ankle or foot may be supported by having a neatly folded towel (as they come from the ironing-table) folded again, so as to make a sort of trough splint, and placed around it before the bandage is put on. For the purpose of applying moist heat, such a towel splint may be soaked with hot water before or after it is applied to the sprained part.

Besides this mode of treating sprains, wooden or other splints may be used if necessary and convenient.

In Sprains of the Wrist the hand and forearm may be laid on a straight splint, covered with cotton or wool so as to make the surface soft, and be lightly secured to it with a soft bandage or broad strips of

sticking-plaster. One of these strips should go round the hand, and one or two round the forearm above the wrist—not over it. The bandage should cover all.

Sprains of the Ankle should never be treated lightly. In them there is not unfrequently a fracture of the inner surface of one of the leg bones that form the ankle joint. This complication gives rise to so much trouble, and requires such skilful and patient treatment, that it has come to be believed that it is better to have a broken leg than a sprained ankle. The general principle in the case of a sprained ankle is: first to put the joint at complete rest, then to allay inflammation, if it arises, and afterward to promote the absorption of inflammatory products. For the first, a splint and bandage usually suffice; for the second, applications of hot water; for the third, friction, and kneading of the joint, with careful motion of it, and alternating hot and cold douching. But in few cases is it truer that “he who doctors himself has a fool for a patient.”

Dislocations.

A dislocation consists in the displacement of the articular (or joint) end of a bone. It can not occur, except when the same joint has been out of place before, without the tearing of ligaments whose function it is to keep the joint close. A dislocation can be detected by the occurrence of pain and comparative immobility of the joint. There is also deformity, which can generally be made apparent by comparing the injured joint with the corresponding sound one of the other side.

Dislocation of the Fingers can usually be reduced—or put in place—by strong pulling, aided by a little pressure upon the parts of the bones nearest the joint. These must then be retained in place with a splint and bandage, or sticking-plaster. . Certain dislocations of the thumb are, even for surgeons, sometimes almost impossible to put in place.

Dislocation of the Lower Jaw may be treated by almost any one. This is fortunate, since it is a very awkward dislocation and very trying to the patient. It may occur at any time and under the most unexpected circumstances.

To reduce a dislocation of this sort, the sides of

the jaw must be seized between the thumb and fingers of each hand, with the thumbs resting on the teeth and the fingers below the jaw, and firm pressure must be made, first downward and then backward. It is important to cover the thumbs with several thicknesses of cloth, and as soon as the jaw starts into place to slip them off to the outer side of the teeth, inside the cheeks, or the releaser is likely to be rewarded by having his thumbs mashed as between upper and nether millstones. He must be very quick, too, for the muscles do not wait, when they have been so unnaturally on the stretch, but bring the lower teeth instantly against the upper like a hammer.

There is a form of dislocation of the jaw in which this is just a little open and can not be opened wider or closed. Such a condition may be treated by slipping a strong spoon handle or table knife between the teeth and prying the jaw wider open. This will make the bone slip back into its place.

Dislocations of the Shoulder, that is, of the upper arm bone from its socket, may be reduced by laying the patient down, sitting alongside of and facing him, and placing the nearest heel (with the boot or shoe removed) in the armpit of the injured side, and then drawing down the dislocated arm and dragging it over toward the sound side. This will usually pry the head of the bone outward and upward into its place. If this does not succeed readily, the

amateur surgeon had better let the dislocation alone. If it does succeed, the bone will go in with a snap. The arm should then be bound to the side, with the forearm carried across the chest and the hand placed on the opposite shoulder.

Dislocation of other Joints ought not to be tampered with at all. The best that can be done for them is to put the parts in the position easiest to the sufferer, to surround the joint with cold, wet cloths, to which laudanum has been added, and to send for a surgeon. The risk of doing injury by injudicious efforts to set a joint is greater than that of waiting until a surgeon can be summoned.

Fractures—Broken Bones.

Broken bones may be recognized by the occurrence of pain, of deformity, of bending where they ought not to bend, and of a sound and feeling of grating at the point of fracture. There are two important divisions of fractures—simple and compound. In simple fractures the break does not communicate by a wound with the air; in compound fractures the bone cuts through the skin, or there is an opening from the exterior to the seat of fracture. The latter are far more serious and dangerous than the former.

Broken bones require treatment as various as the fractures themselves are. Most of them require special appliances, known only to surgeons, and no attempt should be made by any one who has not surgical training to do more than treat a fracture temporarily. However, until the presence of a surgeon can be secured, the following suggestions may be adopted, as far as the circumstances will permit.

Fracture of the Upper Arm.—In this the elbow should be drawn down and placed against the side of the chest, with a layer of muslin or linen between the chest and arm to keep the two skin sur-

faces from coming in contact, as this (especially in summer, when perspiration is free) might cause irritation and even an inflammation of the skin. Then the whole upper arm should be bound gently but securely to the body, and the forearm should be carried in a sling, so arranged that the hand shall be raised a little higher than the elbow. This last point is very important, for if the hand is lower than the elbow it is likely to swell and become painful.

Fracture of the Forearm.—In this the arm should be bent to a right angle at the elbow, and placed in as nearly a natural position as possible, with the thumb pointing up. Then a broad, well-padded splint should be placed along the back of the forearm and hand, going all the way to the tips of the fingers, and another along the front, padded so as to fit to the proper shape of the parts. The splints should be bound on snugly but not too firmly, and the hand carried in a sling which will raise it a little higher than the elbow. In extemporizing a sling for the arm, the sleeve of a coat or shirt may often be utilized by pinning it across the chest; or part of the frock of a coat may be turned up and pinned to the body of it. In using a handkerchief or other cloth, this should be folded into a triangle and the long, straight edge placed next to the hand. The angle should be carried back toward the elbow and may be pinned fast there. This will support the whole of the forearm equally.

Fracture of the Finger.—A broken finger should be straightened out, and bound to a very light splint reaching from the wrist to the tip of the finger. The splint is more comfortable if applied to the back of the hand and finger. It should be, of course, padded.

Fracture of the Thigh-bone.—In this fracture the thigh must be bent up toward the abdomen and the lower leg back toward the thigh, so as to relax all the muscles. Then one splint can be applied to the front of the thigh and another to the back, and bound to it. As a temporary arrangement, the sufferer may then have both legs tied together and lie on his side on a firm bed, with the broken limb uppermost, the heel drawn up near to the buttocks, and the knee opposite the other knee. A pad must always be placed between the knees, or the pressure of one on the other may cause much discomfort.

Fracture of the Knee-pan.—In fracture of the knee-pan (or knee-cap) the whole leg must be bound to a straight splint placed at the back of the limb and going from the hip to the heel. A folded towel, or other pad about three inches thick, should be placed in the hollow at the bend of the knee, so that the leg may not be held absolutely straight; for this position soon becomes very painful. The part under the heel must also be well padded. Then the whole leg should be raised at an angle of about forty-five degrees with the body, and supported with pillows.

Fracture of the Leg below the Knee.—In this fracture the leg should be drawn down and placed in a natural position, using the sound leg for comparison. Then a pillow should be placed under it. Broad bandages should be passed under this and tied together over the limb, so as to draw the sides of the pillow pretty firmly up against it. (See Fig. 6.) A light piece of board, or several such pieces, may be bound on afterward to secure greater

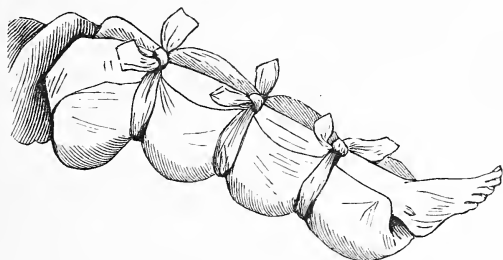


FIG. 6.

steadiness, or the other leg may be used as a splint by binding the injured one to it.

In Fracture near or at a Joint it is best to bend the limb a little and lay it flat on a pillow, keeping it cool and moist. Breaks at or near a joint are especially serious, and demand the best skill that can be obtained.

Fractures of Bones that lie deep in the Body, like the hip-bone or the shoulder-blade, are,

fortunately, very rare. They are hard to detect, and can be treated only by placing the sufferer in a comfortable position and securing rest and coolness until a surgeon comes. If there is much pain, opium in some form should be given—a tablespoonful of paregoric or a half teaspoonful of laudanum, to an adult.

Fractures of the Ribs must be treated in the same way. It is a good plan, however, to put on the side of the chest where the break is, long strips of sticking-plaster, about two inches wide, placed

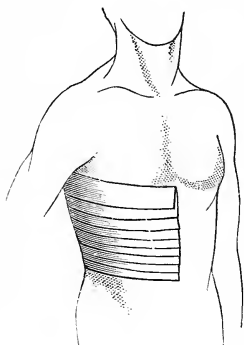


FIG. 7.

parallel to the ribs and applied very snug, beginning at the lowest part of the chest and going up, each strip being made to overlap the one below about half its width. The strips should extend from the spinal column to the middle of the breast-bone. This makes the chest-wall more rigid and prevents the rubbing together of the broken ends of the bone. (See Fig. 7.)

In Fracture of the Collar-bone the patient should be laid on his back, on a hard, flat, hair mattress, or on a settee, with a folded blanket under him (never on feathers), without any pillow, and kept so until the surgeon comes. This is one of the

best ways to treat a broken collar-bone even until it is quite healed.

If a patient has to be moved before a surgeon can attend him, and he can not lie flat as just recommended, it will be well to brace his shoulder back with handkerchiefs, as shown in Fig. 8. Another good temporary dressing is made by placing a pad in the arm-pit and bandaging the arm to the side

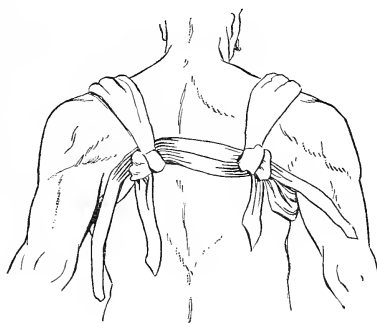


FIG. 8.

with a support passing from below the elbow of the injured side diagonally across the chest and back and over the sound shoulder. In the absence of good bandages this may be done with strong handkerchiefs or pieces of muslin, as shown in Fig. 9.

In Fracture of the Jaw, the parts of the bone should be put in position as nearly as possible, using the rows of teeth as a guide. Then the jaws should

be closed and a bandage be put around, so as to keep the two rows of teeth against each other. (See Fig. 10.)

In Fracture of the Skull there is nothing the non-medical can do better than to place the patient on his back, with the head very slightly raised, and to apply cold, wet cloths to the head. If much time

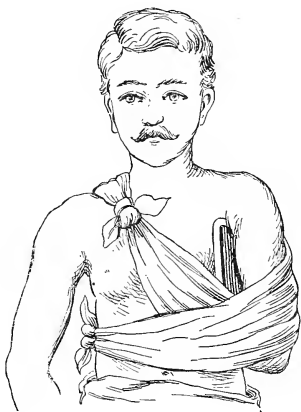


FIG. 9.

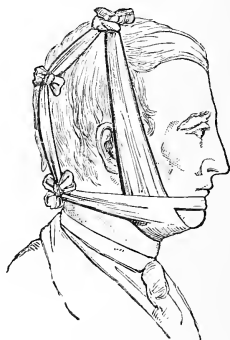


FIG. 10.

must elapse before a surgeon comes, it is well to give a brisk purge or an injection, so as to get the bowels well cleaned out.

Fractures of the Spinal Column (broken back) are very hard to detect. But if one be suspected, the patient must be moved as little as possible. He

had best be laid flat upon his back, and, if possible, he should not be disturbed until the surgeon directs it. Turning such a patient over upon his face may prove fatal, and must not be permitted.

Compound Fractures, as has been remarked, are those in which there is an open wound communicating with the broken ends of the bone. They are to be treated, in an emergency, like simple fractures in the same locations, with the additional precaution that they must be thoroughly cleansed and kept clean, and the greatest care must be exercised to keep the sharp edges of the bone from doing any further damage.

In all Fractures, cloths wet with cold water may be applied to the surface, so as to prevent, as far as possible, the swelling which usually comes on soon after a fracture, and which often interferes very much with the examination of the surgeon.

Splints.—There is nothing in which there is a greater call for ingenuity and fertility of resource than in extemporizing splints for broken bones. Pasteboard, leather, shingles, pieces of cigar box—anything fairly smooth and stiff—may be used. A surgeon at the seashore once got himself no little credit by setting a broken arm on the beach, folding up and using as a splint a large newspaper which he had been reading. The chest usually serves as a very good splint for the arm; and when a leg is broken, the other one will make a good temporary

splint (Fig. 11), or a coat-sleeve, or leg of a pair of

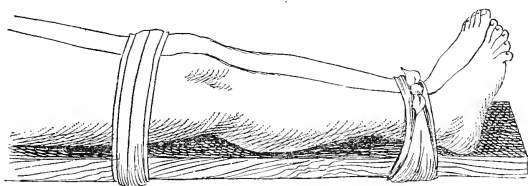


FIG. 11.

trousers, stuffed with grass or hay, may prove serviceable.

Wounds.

In studying wounds we shall adopt the classification customary in works on surgery, viz., contusions, contused, lacerated, punctured, poisoned, incised, and gunshot wounds.

Contusions are what are usually known as bruises, and almost all wounds of the soft tissues caused by blows. They are sometimes very painful, and are often followed by discoloration, due to the escape of blood under the skin from the small vessels of a part. A "black eye" is a familiar example of an injury of this sort.

Contusions are sometimes very simple; as in the illustration just given. Such contusions are best treated at first, when painful, by the application of *cold*, wet cloths, or with some simple ointment like vaseline or cosmoline or cold cream. Pure laudanum, or laudanum and water in equal parts, is often a very acceptable application. Later, when the pain has subsided, *hot*, wet cloths are best, as they favor the carrying off of the blood that has escaped.*

* Experience teaches that cold is best for recent injuries and that heat is best for old ones.

Contusions of the Chest or Abdomen may be very serious; for, besides the external bruises, important internal organs may be injured. Evidence of this may be seen in spitting or vomiting of blood, or in its passage from the bowels or from the bladder; or it may be shown by the occurrence of great depression. In such cases little can be done by the non-professional person beyond securing complete rest and sustaining the strength of the sufferer by means of warmth applied externally and careful stimulation internally, as described in speaking of "Shock"—to which reference may be made.

Contused Wounds.—These are cuts or tears accompanied with bruising of the tissues. They are to be treated like lacerated wounds (see p. 71). Unless they bleed freely, and if they are severe, warm applications are better suited to such wounds than are cold ones.

Incised Wounds, or clean cuts, if simple and small, call only for a piece of sticking-plaster, and perhaps a bandage. If large, the edges should be brought as near together as possible, and supported so with strips of sticking-plaster (as shown in Fig. 12),* or bandages, or the hands, until the coming of a surgeon. If an entire part be cut off, such as an ear, or a nose, or a toe, or a finger, it should be cleaned

* The only "water-proof" adhesive plaster that I know of, is known as "Mechanic's Arnica Plaster." This will remain attached (if properly applied) in spite of repeated washings of the surface.

with lukewarm water and put in its place, and kept warm, leaving to the surgeon the decision whether or not it is worth while to try to save it. Some very remarkable cases of reunion of such parts are on record ; and an attempt to save them is not to be lightly rejected.

Any person with fair skill and some nerve may

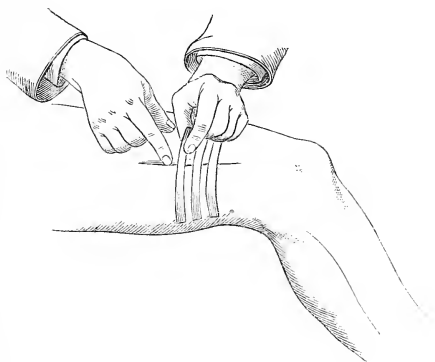


FIG. 12.

stitch a wound, if it seems necessary, using a clean needle and plain black silk or cotton thread—the former being preferable—and taking care to pass the stitches quite through the skin, and to adjust the edges accurately. Hairy parts should be shaved before sticking-plaster is applied to them, or being stitched. On the head, long hair can sometimes

be used to tie across the wound, so as to bring its edges together.

Cuts of the Walls of the Abdomen are often followed by escape of a portion of the bowels. This, if dirty, should be cleansed with warm water ; and a gentle effort should be made to restore it to its place. If this fail, it should be covered with a clean white cloth soaked in warm water. The cloth should be kept warm and wet by means of a gentle stream of water, or by laying on it a sponge soaked in warm water, so as to keep it constantly moist.

Cuts of the Chest Wall may be followed by escape of a portion of lung. This should be treated in the way just described for escaped bowel, except that no attempt should be made to push it back ; for this is more likely to do harm than to do good.

Cut-throat Wounds usually require, in addition to the ordinary treatment of the wound, that the head shall be bent forward, with the chin close to the breast-bone, and kept there.

The way to wash delicate structures, such as the intestines, or raw cut or torn surfaces, may be described here, as it is a good plan to learn to do such things by practising them before the emergency arises. Dip a sponge in water, and hold it in the closed hand, with the thumb uppermost, and a corner of the sponge hanging below the fist. Now, on squeezing it regularly, a single stream of water will

flow softly and steadily down from it. The size of this stream can be regulated by the way the sponge is squeezed, its force by the height to which the sponge is raised. This is the only way to clean delicate tissues that is safe in the hands of the unexpert.

Lacerated Wounds are tears with ragged or blunt edges, such as are often caused by machinery, bricks, clubs, timbers, stones, dull tools, glass, hooks, etc. These often require surgical skill. Until it can be obtained, the torn part should be washed with a stream of lukewarm water squeezed from a sponge, as described above, so as to remove any foreign matters that can be so dislodged, after which they may be placed as nearly as possible in their natural position, and covered with a cool, wet cloth, or a cloth soaked in laudanum or alcohol. If the tear has been very great, and the sufferer is depressed and cold, teaspoonful doses of brandy or whiskey in hot water may be administered, and a cloth wrung out of hot water may be placed over the injured parts.

Punctured Wounds are made with sharp-pointed objects, like arrows, pins, needles, nails, tacks, fish-hooks, glass, thorns or splinters.

Pin Wounds rarely do much harm ; but if they are the cause of anxiety they may be well squeezed while held in quite hot water, so as to provoke a rather free flow of blood, which will wash out any poisonous matter that may have been deposited in the wound.

If a Needle is run into the flesh and comes out, it should always be examined carefully ; and if any part, from point to eye, is missing, a surgeon should be called. Meanwhile the wounded part should be kept perfectly still, and no attempt should be made to remove what remains. This would probably be quite in vain, and would only increase the difficulty of the surgeon's work when he arrives. The broken needle should be carefully kept and shown to him, as he will then know better what to look for in his examination.

Wounds made with nails or tacks are usually situated in the foot. In treating them one must try to make sure that no part of the nail or tack remains in the wound. After this it is often desirable to slightly enlarge the opening in the skin, to put the foot in hot water, and to squeeze some blood out. Then a dressing of hot water or a clean poultice may be used for a while to keep the skin from becoming so hard as to keep back any matter that may form.

If a fish-hook is caught in the flesh, the best thing to do is to cut off the string, to push the point of the hook through, and to draw it out, like a needle in sewing. The broad part of the hook may have to be cut off before trying this. This may be done with a strong pair of nippers or cutting pliers (such as bell-hangers use), or by means of a strong knife and a hammer. The latter method (of which the author has had personal experience) is, however, an exceed-

ingly painful one. After removing a fish-hook, the wound may be treated as advised above for pin wounds.

Thorns rarely do harm unless they are poisonous ; and poisoned wounds we shall consider later. Simple thorn wounds may also be treated as advised above for pin wounds.

Splinters are dangerous in proportion to their size and according to the part they enter. Small splinters may be picked out with a needle, or cut out with a sharp knife.

Splinters under the Nails sometimes defy attempts at removal by the non-medical. But the way to succeed is to soak the nail in hot soap-suds, and then to scrape it as thin as possible over the splinter, and to split it, or cut a little tongue out, so as to get at the splinter. If, after this, the splinter can not be removed, it will easily come away of itself when matter forms ; so that, in any case, the sufferer will be better off for submitting to this little operation.

Splinters of Glass are quite beyond most people's skill. If any pieces can be removed, this should be done. Afterward they are best treated with cold, wet applications, and left otherwise entirely to the surgeon.

Splinters in the Eye should be pulled out, if possible. If they can not be removed at once, a few drops of oil should be put in the eye, the eyelid should be gently closed, *both* eyes should be covered

with a layer of cotton soaked in cool water, and a bandage should be placed round the head, so as to keep the lids as still as possible. This bandage should not be too thick or put on too tight, and the application should be kept cool—with ice-water, if need be.

If a large splinter enters the body, an attempt may be made to pull it out ; but a surgeon should be called without fail, and whatever of the splinter has been extracted should be carefully saved and shown to him. This will aid him in making up his mind whether or not the removal has been complete, and perhaps save much pain and danger to the patient. Splinter wounds may often be advantageously treated like nail wounds.

Nail Wounds.—Of all punctured wounds, those made with rusty nails usually give rise to most concern. But they are only rarely followed by serious results ; and if they are well washed, and if the opening is enlarged a little, and kept open for a few days, no danger need be feared. Nail wounds of the foot or hand sometimes result in tetanus (lock-jaw) ; but this is an extremely uncommon occurrence compared with the frequency of nail wounds. The best preventive is to treat the injury as first described, and to keep the general system in good order.

Poisoned Wounds may be considered here, as they are usually punctured.

Bites of Venomous Serpents demand in-

stant cauterization and the prompt removal of the flesh immediately surrounding the sting. It may be cut out by any one who has the nerve to do it. Before this, perhaps, the part should be encircled, above the wound, with a tight ligature, and, if small enough, it should be thrust into the mouth and sucked hard, so as to extract the poison, or it may be soaked in hot water and squeezed, so as to get some blood out. The immediate application of hartshorn to the wound is of advantage; and a knitting-needle or nail, heated to redness, may be thrust into it. At the same time, whiskey should be given in doses just large enough to cause drunkenness, and the intoxication should be kept up until medical aid can be secured.*

Stings of Tarantulas, Scorpions, Centipedes, Spiders, etc., are to be treated with cold, and hartshorn applied to the point where the sting entered. The sting should be removed, if it can be.

The stings of insects are rarely dangerous to life. They may be treated with cold, wet applications—wet earth is a very good one. The application of a drop of hartshorn or some wet salt often gives great relief.

Bites of Cats and Rats, which are sometimes followed by severe inflammation, should be first

* This recommendation is open to objections that need not be stated here. It is a popular method of treating snake bites, and it is of real service in many cases, because it removes the element of fear which, in snake wounds, contributes very largely to their serious results.

treated by simply cleansing the bites, sucking them, perhaps, or squeezing them under hot water, and applying cold to them for a time.

Bites of Dogs are a terror to some people, while others have little fear of them, though often bitten. If any one is bitten by a dog in good health, only the simplest treatment will be necessary. If the dog is sick, local inflammation or severe constitutional disturbance may follow. In case of reasonable suspicion, the wound may be thoroughly cleansed and an application of hartshorn made to it, in addition to energetic sucking or soaking under hot water to extract any irritating material which may have entered it. Dog bites should *never* be cauterized with lunar caustic (nitrate of silver). This is so generally done that the author must state that, after years of exhaustive study of the subject, and a large experience, he is convinced that such cauterizations are worse than useless. They never do good and often do much harm.

Equally foolish is it to send persons bitten by dogs or cats to so-called Pasteur Institutes. For this there are several reasons: One is, that there is no trustworthy evidence that all such institutions are honestly conducted, while there is a strong belief in this country that some of them are arrant impostures. Another reason is, that a large number of persons have come to their death from the treatment received in such institutions. And, finally, more persons have

died of so-called hydrophobia, and of the laboratory disease caused by the so-called preventive inoculations, since Pasteur Institutes were founded, than died, in an equal time, before the introduction of this dangerous innovation.

It is a most foolish thing to kill a dog that has bitten anybody soon after this has taken place. Such a dog should be caught and kept under the observation of a person of carefulness, intelligence, and special information. The too speedy slaughter of a dog has robbed many a sufferer of the assurance that would have been gained by seeing it living and well, and sent many a one to the grave, as dying of hydrophobia, who never had it, but had been bitten by a healthy and harmless animal.

Again, if one has been bitten, and there be a reasonable suspicion that the dog was what is called "mad," let him not despair. Some of the most able and careful (that is the greatest matter) medical men are of the opinion that most, if not all, cases of so-called hydrophobia are spurious; that is, they are not hydrophobia at all. The author has studied this subject with great care for years, and has become satisfied that the popular theory in regard to hydrophobia is utterly wrong. He also believes it will some day disappear, as the belief in witchcraft—which not long ago was supported by the most respectable medical, clerical, and popular authorities—has disappeared. In most of the reported cases the patients

have been alarmed by what they thought, or frightened by what injudicious friends or timid doctors have said and done, until they died of sheer terror. So much nonsense is believed about hydrophobia by medical men who have not carefully studied the subject, and so much talk about it goes on among the laity, that it is no wonder it is much dreaded by old and young. Children learn about its horrors nearly as soon as they can walk, and no age is secure against a belief in it. But those who see the most dogs liable to be rabid have the least belief in hydrophobia. Keepers of public pounds, dog-catchers, and keepers of kennels in large cities, may be said to never develop hydrophobia though bitten innumerable times. So, in case of a bite from a supposed mad dog, let the things suggested above be done ; and let the bitten person reflect how common are dog bites and how very few are the cases of so-called hydrophobia.*

Gunshot Wounds.—This is another class of injuries occasionally met in civil life, though not common. Ordinarily, little can be done for them, except by a surgeon ; and perhaps all that is advisa-

* The author calls attention to the fact that so-called hydrophobia exists exactly in proportion to the common belief in it and the amount of public discussion it gets. In Paris more cases occur than in any place of its size in the world, because there the medical men are continually keeping the subject before the people. In this country a few newspapers are more or less constantly doing the same thing ; though there has been a great improvement of late in the way they treat the subject.

ble before he comes is to note and remember the position of the body or of the wounded part at the moment it was struck, and the direction from which the missile came, so that these facts may help the surgeon in his search for it.* Then cold, wet cloths, upon which laudanum may be poured, should be kept upon the wound, to prevent, as far as possible, inflammatory swelling; and if, as is very often the case, the patient be in what surgeons call a state of shock—that is, cold and depressed—teaspoonful doses of wine, whiskey or brandy should be given, and heat should be applied to the surface of the body. (See “Shock.”) If a part is badly shattered, the local treatment should be the same, except that, if there is much depression, cold had better not be used at all. There is rarely much bleeding from gunshot wounds, except when large vessels are divided. In such a case the bleeding may be controlled as described under the head of “Hemorrhage.”

*To show how strange may be the course of a bullet, I will cite a case^o that I treated in 1876. A young man was shot with a pistol. The ball passed through his lower lip, struck an upper front tooth, which it broke off, then glanced downward and backward, diagonally through the tongue, and finally buried itself in the floor of the mouth, on the other side from that where it entered the lip.

Railroad and Machinery Accidents.

Railroad and Machinery Accidents may be the occasion of incised, contused or lacerated wounds, or, as is very common, of severe tears, wrenching off of fingers or toes or limbs, or of crushes. Saws, planing-machines, cog-wheels, belts, and many other machines or parts of machines, may cut or tear off a limb or part of one. Such injuries almost always occur when no medical aid can be obtained for some time, and it would be well if some one on every train, and in every establishment in which machinery is in motion, could have some idea of what can be done, and what can not, before a doctor can be had.

Trifling Injuries, whether cuts or tears, are to be treated on the principles already described in speaking of incised or lacerated wounds; that is, the parts are to be cleaned as gently and as well as possible, by letting lukewarm water run over them. Then, any displaced tissue—skin or flesh—may be put in place, and a clean cloth, soaked in laudanum or alcohol, or whiskey mixed with an equal part of water, or water alone, may be laid upon the wound and bound on loosely with an extemporized bandage.

Bleeding is not usually severe after railroad and machinery accidents, because the wounds are generally inflicted in a way that closes the blood-vessels as they are torn or twisted off.

Large Tears, or Lacerations, must be treated by carefully removing fragments of clothing or dirt or splinters from the wound and washing it with lukewarm water. For removing foreign matters, the best pair of forceps is in everybody's possession—that is, a finger and thumb; and no one need be afraid to use these with reasonable care, after washing them very clean. They may be aided occasionally by touches with a clean linen or muslin cloth or a clean sponge or small mass of cotton; but these must be undoubtedly clean.

After cleansing is complete, the torn parts must be put in position, and kept so by bandages, sticking-plaster, or the hands of another person, as may seem best. Sometimes a splint is required. This is usually easy to prepare in a mill or on a railroad. It may be clumsy—that is not of much consequence—but it ought to be sufficiently large to keep still not only the injured part, but also, in case of a limb, the joint above and the joint below the injury. (See “Splints,” p. 65.)

Such injuries often cause comparatively little pain. If there should be severe pain, laudanum may be given—about 30 drops to an adult. Cold or hot cloths, whichever are most comforting, must be ap-

plied to the injured part, and symptoms of depression must be treated as described under the head of "Shock." (See p. 83.)

When Fingers or Toes are Crushed they ought to be washed, modeled into good shape, dressed with a piece of soft, white cloth which has been wrung out of hot water, and bound upon a splint.

If a finger or toe hangs by a mere shred, it may be cut off entirely.

When Fingers or Toes are Torn off the stumps almost invariably require a scientific amputation. But, until this can be decided upon, they must be cleansed, and treated with a cool, wet application of some sort, and then not be meddled with.

Hands or Feet that have been Crushed must be treated by being wrapped up in a soft, warm dressing, like cloth or cotton or wool. Cold is to be used only if there is profuse bleeding. The injured part must invariably be supported with some sort of splint and placed about on a level with the body. One who has received such an injury ought to be made to lie down, unless some other course is absolutely necessary for moving him or is authorized by a surgeon. Such injuries rarely cause much pain, but they almost invariably cause great depression. This must be met by keeping the sufferer warm with wraps and hot cans or bricks or bottles, and giving him every few minutes a *small quantity* of whiskey

or brandy (a teaspoonful) in a little hot water. Larger doses of spirits are not needed. (See "Shock," p. 83.)

When Hands or Feet have been Torn off or cut off with wheels, the stumps are to be treated as described, and the limbs are to be placed in such a position that the injured point is higher than any other. These injuries are usually accompanied with depression also, and this is to be combated in the manner described for shock.

Crush of the Arms or Legs is to be treated like crush of the hands or feet. But here the prostration is usually much greater, and the need for support, with warmth and stimulants, is more urgent. The clothing should on no account be disturbed, except in so far as it can be cut away and replaced with warm coverings, or as is necessary to find out the nature of the injury or to control bleeding.

Crushes of the Chest are sometimes instantly fatal, and almost always cause death in a short time. In such cases, as well as in case of

Crushes of the Lower Part of the Body, there is nothing that can be done besides securing rest, warmth, and moderate stimulation. The sufferer should be made as comfortable as possible, and prepared for the almost inevitable issue.

Shock is a condition which has been alluded to already, in speaking of certain injuries. It may also be caused by fright, as, for example, that which may

accompany a trifling gunshot wound, or by a profound mental impression of grief, or even of joy. It may be caused by a blow upon the pit of the stomach, or by a sudden and severe pain, or even by drinking a large quantity of ice-cold water. It is very common after gunshot wounds, and almost invariable after serious railroad or machinery or mine accidents.

The signs of shock are: great paleness, a cold, clammy skin, a feeble pulse, feeble breathing, a pinched face, dull eyes, drooping eyelids, dilated pupils, bewilderment or dullness of mind, or even insensibility. A person in such a state may die very soon, and will surely die before long, unless he can be brought out of the shock. This requires prompt, energetic, and persistent effort on the part of those who come to his assistance. Heat must be applied, if possible, to the whole body, and especially to the region of the heart and pit of the stomach. This can be done by means of a hot bath, a hot fire, hot cans, hot bottles, stove-plates, heated blankets—in fact, anything hot that can be got hold of.

In applying heat, care must be taken not to burn the patient; for in a state of shock he may not feel pain from an amount of heat which would severely burn him.

At the same time hot drinks, to which brandy or whiskey has been added, may be given. A teaspoonful of brandy or whiskey in a tablespoonful of hot

water may be given every ten minutes for several hours. Larger quantities do no more good, and may do harm.

Manufactories, mines, and railways ought to be furnished with appliances for the treatment of shock and some one who knows how to use them ; for shock almost always follows severe railroad or machinery accidents, and is the most common cause of death after them, as any hospital surgeon could testify.

Hemorrhage—Bleeding.

There is no accident so appalling as hemorrhage, and none that calls for more nerve in combating it; nor is there any in which a little accurate knowledge can be more valuable.

The subject of the control of hemorrhage will be better understood after taking a concise view of the anatomy of the organs of circulation. This cannot be made absolutely accurate without being too technical, but the variations from accuracy will not affect its practical utility. (See Frontispiece.)

The blood starts from the left side of the heart, and is driven first into the aorta, which curves over backward above the heart and descends along the left side of the spinal column, within the chest and abdomen. From what is called the arch, at the beginning, are given off the vessels that supply the head and arms. The former (the carotid arteries) lie, one on each side of the windpipe, and divide in various directions. The latter curve forward and come out from the chest over the first rib, passing under the collar-bone near the shoulder, and down through the arm-pit and along the inside of the arm to the middle of the front of the elbow, where each divides into

two branches. These extend along the front of the forearm, one on the thumb side and the other on the little finger side. Thus, in the upper arm, the arteries follow nearly the same line as the seam in a coat-sleeve. The two arteries of the forearm, entering the palm of the hand, join in a loop, from which vessels run down, one on each side of each finger, and one on the inner face of the thumb.

The aorta, as it descends through the chest and abdomen, gives off vessels to supply the internal organs, and near the lower end of the backbone divides and sends a large vessel out through each groin into the thigh. Each of these passes down in almost a straight line, between the muscles, to the middle of the hollow at the back of the knee. Just below this it divides into three branches. The first of these passes through to the front, between the two bones of the lower leg, and runs down under the muscle, close to the outer side of the shin-bone, and passes out upon the instep at about the middle of the front of the ankle-joint. Here it breaks up into smaller vessels that supply the upper surface of the foot.

The second and third branches of the main artery of the thigh pass down the back of the lower leg, one on each side, close to the corresponding bones and deep under the muscles. One passes back of the inner ankle-bone into the inner side and sole of the foot. The other passes back of the outer ankle-bone to the outer side and sole of the foot. The arteries

of the sole of the foot, like those of the palm of the hand, unite to form a loop, from which a vessel is given off for each side of each toe.

This is a brief outline of the course of the arteries. As they divide and subdivide, like the branches of a tree, they become correspondingly smaller, and they end in an inexpressibly fine network of minute vessels. These are called capillaries. Then, as the capillaries are a sort of splitting up of the smallest arteries, so, on the other hand, by the confluence of a number of capillaries, larger branches result, toward which the current of blood constantly sets, and the beginnings of the veins are formed. These unite in a manner the very reverse of the branching of the arteries, and, growing, like rills and brooks and rivers, larger and larger by repeated junctions of several into one, extend back to the heart in a direction opposite to that of the arteries. Of veins there are two sets: the deep, which lie alongside the arteries, and the superficial, which lie near the surface just under the skin. Each principal artery has at its side at least one vein of corresponding size. Up the legs, up the inside of the abdomen and chest, up the arms and down the neck they pass, until they unite to form one trunk, which empties into the right side of the heart.

From this point the blood is pumped into the lungs to be aërated; from the lungs it is collected and emptied into the left side of the heart; and

from the left side, as we have seen, it is pumped out to begin the circuit through which we have just traced it.

The frontispiece will give a fair idea of the course of the main blood-vessels, and may make clearer what may not have been understood from the preceding description.

The position of the blood-vessels is always in the safest part of the body or limb. They all lie where they are protected by bending a limb or a joint—a natural act when attacked. They are on the inner side of the arm and forearm. They are on the inner side of the thigh and at the back part of the leg—out of harm's way. In endeavoring, as shall hereafter be recommended, to check bleeding by pressing upon a main blood-vessel, this fact may serve as a reminder of the course it might be expected to run. To which this suggestion may be added, namely : When you are in doubt, feel for the pulsation of the artery and make pressure where you feel it beating. Another point, preliminary to considering the methods of arresting hemorrhage, is that blood from arteries is usually bright red and escapes in jets, while blood from veins is dark red or purple, and flows in a steady stream. Blood from capillaries is of a color between these two, and it oozes out.

Capillary Hemorrhage follows every cut. The color of the blood is red ; the flow is generally slow and not very considerable. It usually stops of itself.

If it does not, the part may be elevated and cold water or ice or snow or even vinegar may be applied. If there is oozing from a large raw surface, a towel may be folded, dipped in water as hot as the hand can possibly bear, lightly squeezed, so as not to drip, and firmly pressed upon the bleeding surface. This may have to be renewed once or twice, at intervals of a few minutes, but it usually acts like magic in this form of hemorrhage.

Hemorrhage from the Veins is generally slow and steady, and the blood is dark. It rarely demands special effort to control it. When severe, the application of cold, and firm, continuous pressure upon and *below* the wound generally suffices to stop it. A folded linen or muslin cloth, bound on dry, with moderate firmness, or direct pressure with a finger, will usually stop any bleeding from a vein. Rupture of *varicose veins* in the legs may lead to dangerous hemorrhage, but this can usually be checked by applying a pad of dry cloth and binding it firmly down upon the bleeding spot. In this case a ligature applied *above* the wound would make the matter worse; for the blood passes up in the veins and not down.

A wound of the jugular vein, on the side of the neck, is usually followed by dangerous hemorrhage. This is to be treated with a pad and pressure. The latter can be best made with one finger laid above and one below the wound.

Hemorrhage from the Arteries may be very dangerous. Here the blood is bright red, and spurts or comes in jets from the divided vessel. If it be from a large artery, like those in the root of the neck, or the armpit, or the inside of the thigh near the groin, life will usually be quickly lost. Indeed, without a thorough acquaintance with anatomy,



FIG. 13.

little use could be made of any advice that could be given here. The only thing to suggest is to thrust a finger deep into the wound, and to try if firm pressure there will stop the bleeding. Or, some other form of plug may be tried. For wounds high up in the neck or about the jaw, pressure may be made with the thumb at the root of the neck, just outside the

windpipe and near the collar-bone, pressing the carotid artery back against the spinal column in the neck, as shown in Fig. 13. In all cases of hemorrhage, clots should never be disturbed, for they are Nature's means of stopping hemorrhage. These and fainting sometimes put a stop to bleeding, and aid the professional or amateur surgeon.

When the arteries of the limb are cut, the helper must be as cool as possible and as quick as is consistent with coolness. The principle that must guide every attempt to stop the bleeding is to obstruct the artery at the spot, or between the centre of the body and where it is cut ; for this is the direction in which the blood flows.

For Wounds high up in the Arm, strong pressure may be made downward, behind the collar-bone, about at its middle (see Fig. 15). The thumb, or the handle of a large door-key, well wrapped, so as to make a tolerably thick mass, can be thrust down ; and if it does not seem to strike the artery the first time, it can be moved along, toward the breast-bone and toward the shoulder, to see if it will hit the right place.

For Wounds of Arteries of the Finger, pressure may be made on the side that is cut, by seizing the finger between a thumb and finger and pinching it, or by wrapping a cord round or by slipping on a rubber band. In wounds of the thumb, pressure must be made on the front of the injured

part. No violent pressure is needed in treating these cases.

For Wounds of Arteries of the Hand, raising this above the head and making firm pressure on the bleeding spot, or with *both* thumbs just above and in front of the wrist, will usually stop the bleeding. Or the wound may be packed with lint or cotton or old muslin or linen and bound firmly with a bandage. If this fail, resort must be had to the measures recommended for the next form of hemorrhage.

For Wounds below the Elbow, first grasp the upper part of the arm with the fingers and thumb, as shown in Fig. 15, and squeeze as hard as possible; then let some one make a thick, hard knot, as big as an egg, in the middle of a handkerchief, place it over the middle of the front of the arm, immediately above the elbow, tie the ends firmly at the back, and bend the forearm up so as to press hard against the knot (Fig. 14). This, if successfully done, will obstruct the main blood-vessel (the brachial artery), which in this place lies in the middle line of the bend of the elbow.

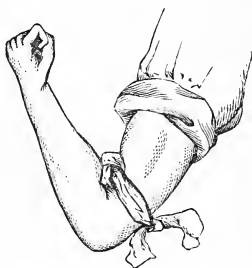


FIG. 14.

For Wounds in the Upper Arm, pressure may be made against the bone on the inner side and just below the swelling muscle that most people know is called the biceps, as shown in Fig. 15. A knot

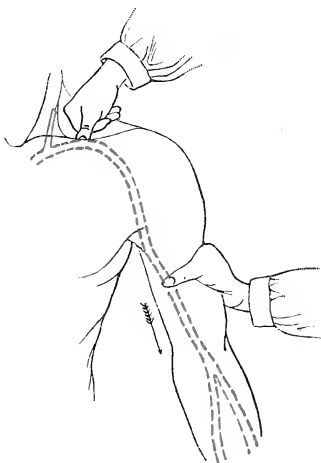


FIG. 15.

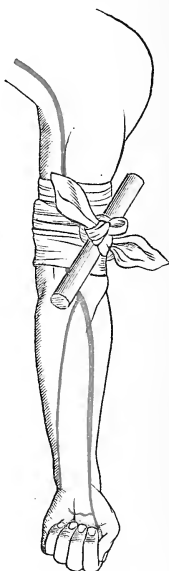


FIG. 16.

as big as a fist may then be made in any piece of cloth and shoved hard up into the armpit, while the elbow is brought straight down and held or bound firmly against the side of the chest.

If either of these methods fails, or can not be carried out, the "Spanish windlass" may be used. To do this, place some hard, round body, like a stone, in the large part of a handkerchief folded diagonally, or knot the middle, and carry the ends round the limb, so as to leave the lump over the position of the artery—that is, over the bend of the elbow, or a little in front of the middle of the inside of the upper arm, near the shoulder. Then tie the ends of the handkerchief so as to make a loose loop, slip a stick through this, and twist it round and round, so as to tighten the handkerchief, until the blood stops flowing, *but no more!* (See Fig. 16.) This is a much rougher procedure than the method described before; but one can not be over-particular in such cases. So if the former fails, or no bystander is cool enough to carry it out, no time must be lost before the "Spanish windlass" is used.

Wounds of Arteries of the Foot or Leg may be treated with firm pressure in the hollow just behind the knee (above the calf of the leg). This can be effected by placing there a knotted cloth, like that suggested for the armpit, and doubling the leg back until it presses hard against it. In doing this, the thigh must be doubled up toward the abdomen, or the bending of the knee will soon become intolerably painful.

For Wounds in the Thigh, pressure must be made in the hollow immediately below the groin,

about two-thirds of the way from the hip-bone to the middle line of the body, where the artery of the thigh (femoral artery) comes out of the body, as shown in Fig. 17. This can be effected with the thumbs or with a rounded stick, or a key-handle, or with a



FIG. 17.

“Spanish windlass.” The artery may also be closed by placing in the groin a knotted cloth, or a large round stone, and doubling the leg back on the thigh (this is important), and the thigh forward, hard against the abdomen. If this latter plan does not succeed promptly, some other one of those mentioned should be tried, and no time be lost in doing it.

Bleeding from Arteries of the Scalp can be controlled by firm pressure upon and around the bleeding point. This can be made with a dry pad bound firmly on with a bandage, or

held in place with a finger or two.

Recapitulation.—To go over this briefly again : Remember, first, to keep cool ; second, that the prin-

cipal object is to obstruct the artery above the cut, and that this can be effected by pressure, in the several cases, in front of the bend of the elbow, in the armpit, behind the bend of the knee, or just below the groin. Pressure can be made with the fingers, or with a knot held hard against the artery with a tight bandage, or by bending the limb up against it—or, in case of the arm, by pressing it hard against the chest. In case of failure, the “Spanish windlass” is to be applied at the same points.

An effective tourniquet can be made by passing a piece of elastic tubing several times round a limb, stretching the tubing as each turn is made, and finally tying the ends so that they shall not slip. Very strong compression can be made in this way, and some judgment is needed, not to make it too strong.

In case none of the plans proposed can be carried out, a cut that bleeds profusely may be stuffed with a rag or dry earth, this being kept in place by pressure with a bandage or handkerchief; or the cut part may be forcibly compressed in any way; or a finger may be thrust into the wound, and held wherever it seems to do the most good.

Finally, let it be remembered that clots are not to be disturbed; that raising a limb will often put a stop to even severe bleeding; and that fainting may put an end to hemorrhage, as well as that when consciousness is restored the bleeding may recur. This possibility should not be overlooked. The treatment of

a faint under these circumstances—if it is so grave or so prolonged that it must be treated—is the same as that of any faint: in addition to the measures demanded to check the bleeding, the head must be lowered, the legs and arms may be elevated, and warmth applied to the body, while stimulants are carefully administered by the mouth.

Special Hemorrhages.

Bleeding from the Nose is often only Nature's way of getting rid of an excess of blood ; but it may be so profuse as to threaten life. If this be the case, of course medical aid will be summoned. Until it arrives, the patient must be kept lying down, and a cold key or a cloth dipped in cold water may be applied to the nape of the neck. If this does not soon stop the bleeding, salt and water (a teaspoonful to a cupful) or vinegar may be snuffed up the nose. A dessertspoonful of alum in a cupful of very warm water is also useful ; but vinegar is less disagreeable, and will rarely fail to check the bleeding, unless the case is beyond any except skilled help. In many cases, a small plug of cotton, pushed about an inch up the nose, will control the bleeding ; and even firmly pinching the nose as far up as it is soft (below the bone) will at times stop a very troublesome hemorrhage.

Bleeding after Extraction of a Tooth is best treated by pressing a plug of cotton firmly over the bleeding-point, and holding it there with the finger, or by pressure from the other teeth, until a surgeon can be had.

In Hemorrhage from the Lungs the blood is bright red and generally frothy. It is rarely profuse, and yet, as it is usually coughed up and caught in a handkerchief, it seems to be so. The amount can never be safely estimated in this way. The best treatment is rest in bed, with the body raised in a half-sitting posture, and the swallowing of lumps of ice. The application of cold to the chest, although often recommended, is rarely advisable. A saltspoonful of salt and a teaspoonful of vinegar may be given every fifteen minutes. Most hemorrhages from the lungs stop in a little while without any treatment, and they are very rarely dangerous to life.

In Hemorrhage from the Stomach the blood is usually very dark, looking like coffee grounds. If it is mixed with any other contents of the stomach its appearance may be masked. In such hemorrhages, ice-water or broken ice may be swallowed, and teaspoonful doses of vinegar. Rest in bed must, and the application of cold to the stomach may, be employed.

Hemorrhage from the Bowels may be treated with injections of a teacupful of ice-water and the application of ice to the abdomen. Fortunately, these hemorrhages are rarely dangerous, and the tendency to them can often be corrected by the use of simple laxatives and regular attention to the movements of the bowels.

In Internal Hemorrhage of women, ice-cold

cloths may be placed upon the abdomen. One of the most efficient modes of checking such hemorrhages is to use large injections of water as hot as can be borne, directed to the source of the bleeding. Rest in bed, without a pillow, and *with the head lower than the body*, must also be secured. The foot of the bed may be raised to favor a correct position of the body. Ten grains of quinine, dissolved in water, will often promptly check such a hemorrhage.

Transportation of Injured Persons.

If injured persons have to be removed from one place to another, it is worth while to know how to do it with the greatest ease and safety to them. If a door or shutter or settee is at hand, any of these will make a good litter, with a blanket or shawls or coats for pillows. In placing a person upon a stretcher, it should be laid, not alongside of him, but with its foot at his head, so that both are in the same straight line. Then one or two persons should stand on each side of him, and, raising him from the ground, slip him up on the stretcher. This can be done smoothly and gently; whereas, if a stretcher is laid alongside the injured person, some of those who lift him will have to step backward over it, and in doing so may stumble. One person should, if possible, give his whole attention to supporting the injured part, when a person is put upon a stretcher. A stretcher should not be carried on the shoulders, but should be held with the hands or supported by straps passing over the shoulders of the bearers. The bearers should also march in broken step, and not "keep time." In going up hill, the patient's head should be in advance; in going down hill, his feet.

If a limb is crushed or broken, it may be laid upon a pillow, with bandages tied round the whole, so as to keep it from slipping about (see p. 61). Where an injured person can walk, he can get much help by putting his arms over the shoulders and round the necks of two others. In case of an injury, when walking is impossible and lying down is not absolutely



FIG. 18.



FIG. 19.

necessary, an injured person may be seated on a chair and carried, or he may sit upon a board or a fence-rail, the ends of which are carried by two men, around whose necks he should place his arms, so as to steady himself; or two men may carry him seated on their interlocked hands, in the way known to children as "Lady to London." For this, each of two

persons, standing face to face, should grasp his right forearm with his left hand (its back uppermost), then he should grasp his companion's free left forearm with his own free right hand (also with its back uppermost), as shown in Fig. 18. When no litter



FIG. 20.

can be obtained, the body may be supported by two men, one on each side, with their arms placed behind his chest and under his hips, as in Fig. 19. Another mode of carrying an injured person is that shown in Fig. 20. One man passes his arms from behind

under the armpits and clasps his hands over the chest of the injured person, and raises him from the ground, while another carries one leg over each of his own arms.

In carrying an injured person upon a litter, or what serves for one, the bearers, as stated above, ought not to keep step; but when they are not using a litter, they should keep step.

Poisons.*

Immediately upon the discovery or suspicion of poisoning, some one should be dispatched for a doctor, if possible carrying information as to the poison taken, so that valuable time may be saved. Meanwhile the following may be done.

Unknown Poisons.—If vomiting has set in, this should be encouraged ; if not, it must be provoked. The simplest way to do this is to give large draughts of lukewarm water, and to tickle the throat. A teaspoonful or two of ground mustard, or a teaspoonful of powdered ipecac, or a tablespoonful of the syrup of ipecac may be stirred up in the water. Further, let it be remembered that there is no occasion for fastidiousness. Any water will do. Water in which hands—or dishes, for that matter—have been washed may, by its very repulsiveness, act more quickly than anything else ; and if soap has been

* It is better to prevent accidents than to correct them. It is a good plan to have dangerous articles kept invariably out of reach of children, and to have any bottle containing what may be dangerous marked by a ball and chain, such as the druggists sell, or by tying a stout piece of tape round its neck. This gives warning in the dark as well as in the light. Medicine bottles containing drugs dangerous to children should be labeled "Poison" by the apothecary.

used, it will be all the better for that, as soap is an antidote for many poisons. The quantity used must be large ; the sufferer must be urged to drink and drink, a large quantity at a time, and be made to vomit several times—not pushing this to exhaustion, however.

After copious vomiting, soothing liquids should be given, such as oil, milk, beaten-up raw eggs, or flour and water—all in moderately large quantities. These are especially valuable when the poison has been of an irritating character.

If the sufferer be much depressed in body or mind, the hands and feet cold, the lips blue, the face pale, a cold perspiration upon the forehead and about the mouth, then some stimulant may be administered. Strong, hot tea, without milk, is the best, because it is a chemical antidote to many poisons. Strong coffee is next in value. To either of these may be added brandy, whiskey, wine or alcohol, in teaspoonful doses for an adult and half as much for a child. Or the spirits may be given mixed with a little hot water. Warm coverings are not to be forgotten ; and if the depression be great, hot water-cans or hot bricks, wrapped in one or two thicknesses of blanket, should be laid by the side of the chest, or a huge corn-meal poultice may be placed round the body, or a blanket, wrung out of hot water and covered with a dry one. (See “Shock,” p. 83.)

Oil of Vitriol (*sulphuric acid*) and **Nitric** and

Muriatic Acids are heavy, sometimes yellowish-looking, fluids; the first, as its name implies, not unlike oil in appearance, but very heavy in a bottle. The others are lighter, and give off extremely pungent, irritating fumes. All discolor anything on which they fall; the first blackens white pine wood; the others turn it yellow. All burn horribly, and leave no doubt of their caustic nature.

For these the proper treatment is to give an alkali. A tablespoonful of hartshorn mixed with two teacupfuls of water may be given; or large quantities of baking or washing soda, magnesia, potash, white-wash, chalk, tooth-powder, whiting, plaster, soap, or even wood ashes, stirred up in water.

In poisoning with acids, vomiting should not be provoked, because there is no need to bring back the acid if it has been fully neutralized, and there is no use in doing so if it has not been. After using the alkaline antidote, the bland fluids mentioned above may be administered, and rest secured, and stimulation employed if necessary.

Oxalic Acid comes in small, heavy, bright, colorless crystals, making a clear, rattling sound when shaken in a bottle or jar. For this the best antidote is lime in some form. If lime-water* is at hand, it may be given freely, or whitewash, tooth-powder, chalk,

* Lime-water may be made in an emergency by putting a piece of lime about as large as a walnut in a pint of water and shaking them well together for a few minutes.

whiting, or plaster from a wall. The latter may be crushed and stirred up in water, without regard to the grittiness, which will not do any harm.

Prussic Acid (*hydrocyanic acid*) is a very dangerous poison, and usually immediately fatal. The cyanide of potash (used by photographers) and oil of bitter almonds are poisonous because of the prussic acid they contain. Poisoning with either of these must be treated with an emetic and with bland liquids and stimulants. Hartshorn may be inhaled from a handkerchief. Fresh air must be secured, and artificial respiration may be needed.

Carbolic Acid and **Creasote** are usually in solution, as a thick, clear, pink, or dusky fluid. When taken by the mouth they cause whitening and shriveling of the mucous membrane lining it, with intense burning, and then numbness. There is also nausea, weakness, depression, and sometimes actual collapse. These are very dangerous poisons, because they act as caustics, and also benumb the stomach so that it is hard to provoke vomiting. The best antidote is Epsom salts, of which a tablespoonful should be given dissolved in water. Next in value to this is baking soda, in similar doses. Either of these should be followed by large draughts of oil, white of egg, magnesia and water, or milk. Rest, warmth of the body, and stimulation must also be secured if there is depression.

Alkaline Poisons.—The strong alkalies are *am-*

monia, or *hartshorn*,—which is a clear fluid with an unmistakable odor,—*potash* and *soda*, usually dissolved, and sometimes in the form of lye. Liniments containing these substances are sometimes swallowed by mistake.

The alkalies usually burn intensely. They must be combated with an acid. Vinegar can generally be had; and there is nothing better. It should be given undiluted, and freely—a half teacupful at a time. Lemon juice may be used, or even orange juice; though the latter is too mild an acid to be of much service, unless the oranges are very sour. Vomiting may do harm, and this part of the treatment may well be left to Nature. Bland acid or oily drinks may be given, and rest should be secured.

Arsenic is a white, sweetish powder, often used in fly-papers and powders to destroy domestic pests, such as rats, bugs, and roaches. It is also found in some paints, and in wall-paper or glazed toy-papers. It usually excites vomiting and violent pain in the stomach. As an antidote, large quantities of milk, white of egg, flour and water, oil or lime-water may be given. Vomiting must be encouraged or provoked, and dialyzed iron may be given. This can now be obtained at any drug store, and should be given freely, in tablespoonful doses, each dose being followed at once by a teaspoonful of common salt in about a teacupful of water. If it is not at hand, equal parts of sulphate of iron (green vitriol), or of any solu-

tion of iron, and of carbonate of soda, may be dissolved in separate cups of hot water, and then mixed and drunk. Afterward, vomiting should be again provoked, and followed by a dose of castor oil.

Paris Green and **Fowler's Solution** are arsenical preparations. If taken as a poison, the treatment is the same as for poisoning with simple arsenic.

Sugar of Lead (*acetate of lead*) comes in white lumps or powder. Poisoning with lead is to be treated by provoking vomiting, and giving Epsom salts or Glauber's salts, milk, eggs, and castor oil.

Corrosive Sublimate (*bichloride of mercury*) comes in small, colorless crystals, or in a clear solution; it is also contained in most of the "antiseptic tablets" used in making washes and dressings for surgical cases. For corrosive sublimate poisoning, vomiting must be provoked, and some form of tannic acid should be given. Strong tea is the handiest thing containing this, and its administration should always be followed by giving raw eggs or milk or flour and water freely. Lime-water may also be useful.

Tartar Emetic (*tartrate of antimony and potash*) is a white powder, the taking of which is best combated in the same way as is used for corrosive sublimate.

Phosphorus is found in the heads of matches, and it is contained in some rat-poisons. It is a

poison that acts slowly, and affords ample time for securing medical advice. But five-grain doses of sulphate of copper, dissolved in water, may be given, at intervals of ten minutes, until vomiting comes on. Half-teaspoonful doses of old oil of turpentine are said to be very useful in poisoning with phosphorus. Then a dose of magnesia should be administered; but *no oil*.

Croton Oil is sometimes contained in liniments. It produces great pain in the stomach, with griping and purging, and depression. It should be treated with an emetic, if recently taken, and bland liquids, like oil or white of egg, and the administration of stimulants, and full doses of laudanum or paregoric.

Lunar Caustic (*nitrate of silver*) is sometimes swallowed. The antidote for this is a strong brine of salt and water, given again and again; and vomiting should be provoked until the vomited matters cease to have a look like thin milk. Afterward, a dose of castor oil may be given.

Iodine, in the form of a tincture, is also sometimes swallowed by mistake. The antidote for this is starch and water, or plenty of milk, or flour and water.

Severe burning is sometimes caused by painting the skin with tincture of iodine. The best treatment for this consists in the application of cloths well soaked in thin boiled starch (clear starch), and kept from becoming dry by frequent renewals, or by covering with oiled silk or paraffine paper.

As long as the starch turns blue when put on the burn, active iodine is still in the skin, and the applications should be continued.

Opium Preparations are *opium*, *morphine*, *laudanum*, *paregoric*, *black-drop*, *chlorodyne*, some liniments, and many nostrums sold as soothing-syrups, pain-destroyers, and drops for infants. Opium produces deep sleep, with narrowing of the pupil of the eye to a small circle, which does not enlarge in the dark. Here emetics must be used promptly and persistently, and vomiting must be produced over and over again. Strong coffee must be freely given as a stimulant. So long as the breathing does not fall below ten to the minute, there is no *immediate* danger of death; but opium is a treacherous poison, and requires all the skill that can be obtained to combat it. The important matter is to keep up the breathing. The custom of walking the patient up and down, and slapping him with wet towels, is to be deprecated, because it adds exhaustion to stupor. If an electrical battery can be obtained and used, it is the best thing that can be done. The Faradic current should be applied to stimulate the sensory nerves in the skin, so that they shall excite reflex acts of deep breathing. The next best thing is to lay the patient upon a lounge, and to slap his skin from time to time with the back of a broad brush or with a slipper. This is all the rousing that is necessary as long as the breathing keeps above ten to the minute. Should it

fall below this, or if the breathing should cease, artificial respiration should be employed. (See p. 13.)

Chloral is a damp, colorless, crystalline substance, usually seen in solution. The symptoms and treatment of poisoning with chloral are similar to those of opium.

Belladonna, or its active principle, **Atropia**, is so much used in medicine that accidents sometimes occur from its misuse. Symptoms of poisoning with belladonna are a dilated pupil, a peculiar flush of the face, dry throat, unsteadiness of gait, and delirium. The treatment consists in giving an emetic, followed by rest, warmth to the extremities, and a moderate quantity of strong coffee, or of hartshorn (a teaspoonful in a teacupful of water), wine, whiskey, or brandy.

Strychnine is an intensely bitter, white powder. It produces stiffness of the jaws, then of the limbs and body. It should be treated by provoking vomiting, giving a purge, and doses of thirty grains of bromide of potash, or twenty grains of chloral, or both, to an adult, and one-quarter as much to a child for each five years of its age. The greatest quiet must be secured. The poisoned person should be put to bed in a darkened room, with doors, windows, and shutters arranged in a way that shall exclude all sights, sounds, and draughts, though permitting as good ventilation as possible.

Aconite and **Veratrum Viride**, contained in liniments, are sometimes swallowed by mistake. The patient will often feel a peculiar numbness or tingling in the arms or legs, which is an evidence that the poison has entered the blood, and makes the attention of a physician imperative. If there is depression, warmth should be used, as described when speaking of unknown poisons. The treatment is the same as that for belladonna. (See p. 114).

Hemlock, **Deadly Nightshade**, **Jamestown** (or **Jimson**) **Weed**, **Monkshood**, and **Toadstools** are sometimes eaten without knowledge of their poisonous character. **Tobacco**, **Indian Tobacco**, **Poison Sumac**, and other plants sometimes cause poisonous effects. Nightshade, Jamestown weed, and monkshood produce widening of the pupil and some delirium—usually of a laughing sort, and often a disposition to pick at imaginary objects, but no sleepiness. All are likely to produce deep depression, and must be treated with vomiting, followed by stimulation and warmth, very much as in the case of belladonna poisoning.

Alcoholic Liquors are sometimes taken in such large quantities as to be poisonous. When this is the case there are evidences of deep stupor or depression. The course to be pursued is to cause vomiting, to give hartshorn and water (a teaspoonful in a teacupful), and to keep the body warm. (See "Intoxication," p. 30.)

Decayed Meats or Vegetables usually excite vomiting, which should be encouraged until the stomach is empty, and followed by a dose of castor oil and a teaspoonful of powdered charcoal.

Recapitulation.—We have now completed the list of poisons that are at all common, and have seen what should be done in almost any case that is likely to occur. In conclusion, let it be remembered that, when there is an alarm of poisoning, some *one*, at least, *must keep cool*; then, that a physician is to be summoned (sending him word, if possible, what poison has been taken); and that, until his arrival, the course indicated above should be followed. Another thing which may be remembered is, that accidental poisoning is very rarely fatal. In more than twenty years of practice the author has never seen a case of *accidental* poisoning in which the patient did not recover. So, in case of poisoning, the treatment here suggested may be followed, and it may generally be expected that the patient will get well. To save time in an emergency, the following table may be consulted, which gives the name of each poison we have already studied and the proper treatment for it.

POISON.	TREATMENT.
<i>Unknown</i>	{ Emetic, Bland liquids, Stimulation.
<i>Acids—</i> Sulphuric, } Nitric, } Muriatic, }	{ An alkali. Bland liquids, Rest, Stimulation.
<i>Oxalic Acid</i>	{ Emetic, Chalk, Bland liquids.

POISON.	TREATMENT.
<i>Carbolic Acid,</i> }	{ Emetic, Epsom salts, or baking soda, Bland liquids, Rest, Stimulation.
<i>Creasote.</i> }	
<i>Prussic Acid—</i> }	{ Emetic, Bland liquids, Stimulation.
Oil of almonds,	
Cyanide of potash. }	
<i>Alkalies—</i> }	{ An acid (vinegar), Bland liquids, Rest, Stimulation.
Hartshorn,	
Soda,	
Potash,	
Lye. }	
<i>Arsenic—</i> }	{ Emetic, Dialyzed iron and salt, Castor oil, Rest, Stimulation.
Paris green,	
Scheele's green,	
Fowler's solution. }	
<i>Sugar of Lead</i>	{ Emetic, Epsom salts, Bland liquids, Castor oil.
<i>Corrosive Sublimate,</i> }	{ Emetic, Strong tea, Raw eggs and milk, Castor oil, Stimulation.
<i>Tartar Emetic.</i> }	
<i>Phosphorus</i>	{ Emetic, Sulphate of copper, Turpentine, Magnesia, but no oil.
<i>Croton Oil</i>	{ Emetic, Bland liquids, Laudanum or paregoric.
<i>Lunar Caustic</i> }	{ Salt and water, Castor oil, Bland liquids, Emetic.
(nitrate of silver). }	
<i>Iodine</i>	{ Emetic, Starch and water, Bland liquids.
<i>Opium—</i> }	{ Emetic, Strong coffee, Keep up breathing.
Morphine,	
Laudanum,	
Paregoric, etc. }	
<i>Chloral.</i> }	
<i>Belladonna—</i> }	{ Emetic, Warmth, Coffee.
(atropia). }	
<i>Strychnine</i>	{ Emetic, Purgative, Absolute quiet.

POISON.	TREATMENT.
<i>Aconite,</i> <i>Veratrum Viride.</i> }	{ Emetic, Stimulation, Head low.
<i>Jamestown Weed,</i> <i>Hemlock,</i> <i>Nightshade,</i> <i>Toadstools,</i> <i>Tobacco, etc.</i> }	{ Emetic, Stimulation.
<i>Alcohol</i>	{ Emetic, Hartshorn and water.
<i>Decayed Meat or Vegetables</i>	{ Emetic, Purgative, Powdered charcoal.

To Provoke Vomiting, warm water may be used with or without ground mustard (a tablespoonful to a pint of water), or ipecac (a teaspoonful of the powder or a tablespoonful or so of the syrup), and thrusting a finger down the throat—not too far, however. It is best to give large quantities (that is, a pint at a time) of warm water whenever vomiting is to be excited.

Bland Liquids are milk, raw eggs, some sort of oil, gruel, flour and water, etc.

Stimulants are tea, coffee, whiskey, wine, etc., or hartshorn. Of the last, a half-teaspoonful in a teacupful of water will be enough for a dose. In making tea or coffee, one must not wait to do it as if for the table, but mix hot water and the leaves, or grounds, squeeze them well, stir together, and give the whole—leaves, grounds, everything. At the same time, some may be made regularly, if there are conveniences for it.

Alkaline antidotes (for acid poisons) are hartshorn and water (a tablespoonful in two teacupfuls of

water), soap and water, lime, whiting, soda, chalk, tooth-powder, plaster, magnesia, whitewash, and even wood ashes.

Acid antidotes (for alkaline poisons) are vinegar and lemon juice.

In giving an antidote, one must never wait for it to dissolve, but just stir it up in any fluid at hand except oil, and have it swallowed immediately.

When laudanum is advised for such an irritant poison as croton oil, it must be given in a dose of half a teaspoonful to an adult and a drop for each year of a child's age. Such doses may be repeated in half an hour, if the pain continues to be severe and there is no drowsiness.

Description of Poisonous Plants.

Poisoning is sometimes caused—especially among children—by eating parts of certain plants which grow wild in the woods or fields, or by the roadside as well.

A few of these may be described, so that they may be avoided if possible, or—in case of accident—that it may be known what has done the mischief.*

Bitter-sweet, Woody Nightshade (*Solanum dulcamara*), must not be confounded with the cultivated plant called “bitter-sweet.” The woody nightshade is a shrubby, climbing plant, bearing blue or purple flowers, with an orange-colored center, and oval, bright red berries, that are poisonous.

Deadly Nightshade (*Atropa belladonna*) grows three or four feet high, has large, dark-green, pointed leaves growing on downy stems, with drooping, bell-shaped flowers and blue-black berries (when ripe), marked with a deep furrow. (Fig. 21.)

Fool’s Parsley (*Æthusa cynapium*) grows about two feet high in waste grounds, and looks something

* The treatment of poisoning by any vegetable mentioned here, but not the preceding chapter, is the same as that for belladonna. (See page 114.)

like ordinary parsley (*Apium petroselinum*), but has a disagreeable odor. Its leaves are compound and dark green, and its flowers are white.

Foxglove (*Digitalis*) is a European and Asiatic plant, cultivated in gardens in various parts of the

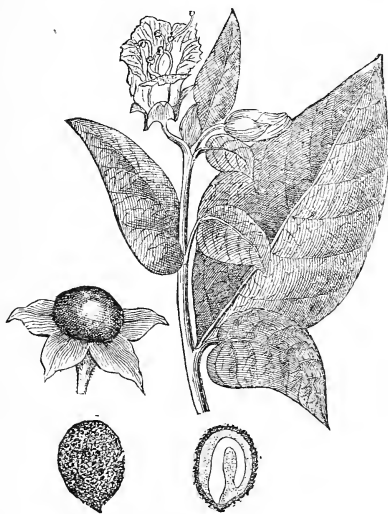


FIG. 21.—NIGHTSHADE.

world. It grows three or four feet high. It has large, dull-green, downy leaves and handsome, bell-shaped crimson or purple flowers, with beautiful spots within, arranged in a "spike." (Fig. 22.)

Hemlock.—Ground Hemlock, Dwarf Yew

(*Taxus Canadensis*), looks like a dwarf spruce tree. It is an evergreen, with small red and juicy berries (drupes) concave on the summit. The leaves and black seeds are poisonous.

Hemlock.—**Poison Hemlock** (*Conium macu-*

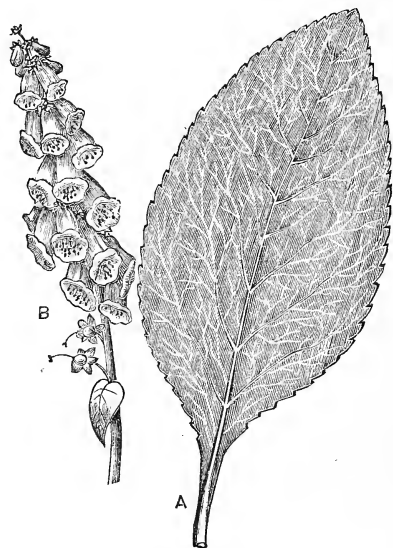


FIG. 22.—FOXGLOVE.

latum) grows from three to six feet high, with many branches, the stems of which are smooth, round, and spotted with purple. The leaves are compound, and bright green. It has small, white flowers, arranged

in umbrella shape. The plant has a disagreeable odor. (Fig. 23.)

Hemlock.—**Water Hemlock**, or **Spotted Cow-bane** (*Cicuta maculata*), is a plant growing



FIG. 23.—HEMLOCK.

from three to six feet high, in damp ground, with slender, compound, notched leaves, on a hollow stem, and small, white flowers, arranged in shape like an umbrella. The root is thick and fleshy, and

very poisonous. The leaves are poisonous, and often prove injurious to cattle.

Henbane (*Hyoscyamus*) is a plant which grows



FIG. 24.—HENBANE.

about two feet high, with large, pale green leaves with scalloped edges. The flowers are straw-colored, rimmed with a purple, urn-shaped cup. (Fig. 24.)

Indian Tobacco (*Lobelia inflata*) grows about two feet high, with a rough, straight stem, pointed, notched, and hairy leaves, with small, pale blue flowers springing from the junction of a leaf-root with its stem.

Indian Turnip, or Jack-in-the-Pulpit (*Arum*),



FIG. 25.—JAMESTOWN WEED.

grows about a foot high, with a peculiar flower on a straight stem, with scarlet berries. The root is turnip-shaped and has a burning taste.

Jamestown or "Jimson" weed, Thorn-apple (*Stramonium*), grows about three or four feet high, with tough skin, ragged leaves, and a white or

tinted flower like a very tall, slender vase. A peculiar feature of the Jamestown weed is the seed-pod, which is green when young and gray-brown when mature and dry. It is very rough and thorny outside, and contains seeds that are soft and white when young, and become hard and black when old. (Fig. 25.)

Monkshood (*Aconitum napellus*) is a native of the mountainous parts of Europe and Asia. It grows about four feet high, with leaves deeply cleft into five parts. Its flowers are dark blue, with a vaulted upper sepal, like a monk's cowl. They are arranged in the form called a spike—several flowers along a common stem.

Poison Ivy, Poison Oak (*Rhus toxicodendron*), is a climbing shrub, sometimes confounded with the Virginia creeper (*ampelopsis*). It is distinguished from the latter by having its leaves arranged in clusters of *three*, while those of the Virginia creeper are in clusters of *five*. Its berries (drupes, botanically) are dull white, while those of the Virginia creeper are dark blue. The poison ivy causes a painful, itching, and very troublesome eruption in some people when it is touched, or even when it is approached. (See p. 138.)

Poison Sumac (*Rhus venenata*) grows ten or fifteen feet high, with wide, spreading branches, leaves three inches long and about half as wide, with long, red stems and small, greenish flowers, with fruit

like a cherry (drupe) but the size of a pea. The whole plant is very poisonous to taste or touch and has a very disagreeable odor.*

Poke-berry (*Phytolacca decandra*) is a very common shrub in North America, growing from four to eight feet high, with a smooth stem, often of a deep purple color, with greenish-white flowers, and clusters of dark purple berries at the end of delicate stems. The plant is not very poisonous, but may cause dimness of vision and even convulsions.

Poke-root, Indian Poke, Hellebore (*Veratrum viride*, *V. album*), grows from three to six feet high, with large, coarse, oval, pointed leaves, with straight veins, with many small, green flowers, arranged at the top of the stem on little branches (panicle). It is an exceedingly poisonous and dangerous plant. (Fig. 26.)

Wild Parsnip (*Pastinaca sativa*) is a plant about three feet high, with compound leaves made of small leaflets arranged along a grooved stem; they are dark green, and downy on the under side. The flowers are yellow, and they grow in small clusters. The root is tapering, like that of the cultivated parsnip. The root of the wild parsnip, unlike that of the food parsnip, has a harsh and bitter taste.

Wolf's-bane (*Aconitum uncinatum*) grows wild

* The common Upland Sumac (*Rhus glabra*), with greenish flowers and purplish, hairy berries, and with beautiful scarlet leaves in autumn, is not at all poisonous.

in parts of the United States. It is a plant about two feet high, with dark green leaves divided into



FIG. 26.—POKE-ROOT.

three or five points (palmate); and with three or four large purple flowers at the end of each branch.

Domestic Emergencies.

No less important than the emergencies thus far considered, most of which have a sort of public significance, are a few more which usually occur within the limits of the household, and try the knowledge and patience of anxious parents. If these emergencies arose only when skilled assistance could be had in a moment, their consideration might be omitted from a book like this. But they have a way of presenting themselves at the dead of night, in traveling, at the seashore, or in the mountains, where doctors are not known or are not to be had promptly; and those upon whom the burden of meeting them falls may be glad to have some simple suggestions as to what they may do until they can commit their interests to others better prepared to guard them.

Cholera Morbus produces vomiting and purging and violent cramps in the stomach. The pain may be so severe as to seemingly threaten life, though a fatal ending of the attack is almost unknown. In the attack there is a pinched expression of the face, and a cool, clammy skin. In such cases, something must be done at once to relieve the pain. For this, laudanum may be given—half a teaspoonful to an

adult, and to a child a drop for each year of its age. At the same time heat must be applied to the stomach. For this purpose a mustard plaster may be used, or cloths wrung out of hot water and sprinkled with turpentine or with red pepper, or a hot-water bag or bottle, or a plate heated at the fire and covered with a cloth. An injection composed of a small teacupful of warm water or milk, to which a tablespoonful of tincture of asafœtida has been added, often gives great relief.

Colic consists in violent griping pains in the abdomen. It is usually due to cold, or to something indigestible that has been eaten. It should be treated with hot applications to the abdomen, such as have just been mentioned. A purgative, such as castor oil or castor oil and spiced syrup of rhubarb, may be given by the mouth, and an injection of water and asafœtida may be administered as described in speaking of cholera morbus.

Vomiting, or Nausea, due to something objectionable in the stomach, may be treated by giving large draughts of quite hot water. If it be due to nervousness or a slight indigestion, it can usually be corrected by swallowing small pieces of ice, or tablespoonful doses of lime-water, or a pinch of soda, or half a teaspoonful of aromatic spirits of ammonia in a wineglassful of cold water, or half a dozen of the soda-mint tablets sold by all druggists. The application to the pit of the stomach of a mustard plaster,

or of a flannel cloth wrung out of hot water and sprinkled with a tablespoonful of turpentine or some red pepper, is also useful. A lump of ice held against the pit of the stomach sometimes does much good. The sufferer should, if possible, lie down until the nausea passes off.

Diarrhœa is usually due to a cold or to something indigestible that has been eaten. In either case it is an effort of nature to cure itself of something hurtful. So, at the start, the best thing to be done is to give a mild purge. It is a good plan to give a teaspoonful or two of a mixture of equal parts of olive oil and castor oil to an infant, and a tablespoonful or two to an adult. Half these quantities of a mixture of glycerine and castor oil acts equally well. Nothing acts better for adults or infants than a tenth of a grain of calomel, given every half hour until it produces a free movement. A teaspoonful of a mixture of equal parts of sweet oil and castor oil, or of spiced syrup of rhubarb and castor oil, for an infant, and two tablespoonfuls of the same mixture for an adult, is often very useful. After this, if the movements of the bowels soon return, half a teaspoonful of essence of ginger in a wineglassful of water may be given to an adult after every passage. If this does not check the diarrhœa, ten drops of laudanum or a teaspoonful of paregoric may be given to an adult after each passage; and astonishing results sometimes follow the giving of a single drop of laudanum every hour. For an

adult, also, an injection, made of half a small teacupful of boiled starch, to which thirty or forty drops of laudanum have been added, often gives immediate relief. For a child over two years old, half a drop of laudanum or half a teaspoonful of paregoric may be given after each passage, until the diarrhœa seems checked or there is some evidence of drowsiness. A simpler remedy, which often acts well, is a tablespoonful of raw flour in a glassful of cool water, to be taken in two doses, half an hour apart.

Dysentery sometimes follows a simple diarrhœa, and sometimes comes on suddenly, with fever, and often with screaming in children. There is a strong and constant inclination to have the bowels moved, but the passages are usually small, and the movements accompanied with severe straining and pain and the discharge of some blood.

The treatment is best begun with a purge of castor oil and rhubarb. Then laudanum may be given by the mouth (half a teaspoonful to an adult, and to a child a drop for each year of its age). Great relief is sometimes afforded by large injections of cold water very slowly and gently given, with the hips elevated and the shoulders lowered, or small injections of thin boiled starch (six tablespoonfuls for an adult and one for an infant), with laudanum in the same dose as when it is given by the mouth. Rest in bed and liquid food are indispensable parts of the treatment.

The discharges from the bowels ought to be disinfected by adding to them *boiling* water or chloride of lime. The vessels used should also be scalded after every emptying.

Croup.—Attacks of spasmodic croup, though very alarming, are rarely dangerous. There is probably much less real croup than is supposed, and the hoarse cough which children sometimes have after taking cold may lead to measures which make it much worse for all concerned. Parents need not get excited when they hear what is called a “croupy” cough. When it occurs, they should first see what can be accomplished by allaying the alarm of the child and by diverting its mind. Turning on a full light, the reading of an interesting story or the exhibition of a favorite toy may cause all the symptoms of croup to disappear.

When such mild measures are of no avail, and the symptoms become more urgent, the little sufferer should be given an emetic of a teaspoonful of syrup of ipecac or a heaping teaspoonful of powdered alum, followed by a draught of warm water. After the attempt at provoking vomiting, it is well to give a purge like castor oil and spiced syrup of rhubarb. Cloths wrung out of water as hot as can be borne should be wrapped round the throat and laid upon the chest. They should then be covered with something to keep the heat in—like oiled silk or a dry cloth.

This is all that can ordinarily be done with ad-

vantage until a physician arrives. But it usually gives decided relief. In this case, and even if it does not, natural anxiety should not drive parents to be wanting to do something else all the time. They may renew the hot cloths as soon as they begin to grow cold, but besides this there is nothing to be done but to wait until there has been time for the spasm to pass off. This is hard to do, it is true ; but it is the best thing to be done, and far better than the fuss and worry, to parents and child, of trying a variety of methods.

Whooping Cough.—Children with whooping cough should go out in fine weather ; in bad weather they should be kept in a well-ventilated room in a warm and (if possible) moist atmosphere. Moisture can be secured by having a flat vessel containing water upon the stove, or by putting a basin of water on a chair in front of a register and hanging a long towel over the back of the chair with one end in the water. The towel may be dipped in the water from time to time as it becomes dry. In whooping cough, the bowels should be kept open, and only good, digestible food should be given. A belladonna plaster on the chest sometimes does good, and if the paroxysms of coughing are very severe, some form of opium may be given. Thirty drops of paregoric may be given to a child two years old and repeated in an hour. A child six years old should have half a teaspoonful at a dose.

In whooping cough there is a strong nervous element; and a spasm of coughing is often brought on by the example of another child. So, when a child is seized with a fit of coughing, it ought, if possible, to be at once separated from other children, for its own good and for theirs. There is nothing of much value in the way of medicine. Fresh air, good food, protection from exposure, and time are the best means to recovery.

Asthmatic Attacks may be treated in several ways. One method is founded upon the fact that asthma is a nervous manifestation, which grows worse the more the attention is directed to it. If the attention can be diverted, the attack will often pass off. Occurring, as it usually does, at night, the darkness, the surprise, the absence of surrounding activities, increase its effects. If the sufferer be a man, and will get out of bed, put on his gown and slippers, light the gas, take a book or paper, and begin to read, he will, in many cases, soon find his trouble diminishing and finally disappearing. If he be a smoker, his cigar or pipe will help him in this emergency.

A less agreeable method is to take an emetic. Another is to smoke the asthma cigarettes sold in every drug store. Another is to get some steaming hot water in a basin, pour into it a tablespoonful or more of Hoffmann's anodyne, and breathe the ascending vapors. One of the best remedies is a full dose of opium in some form—for an adult, thirty drops of

laudanum or a tablespoonful of paregoric. As soon as this takes effect, the spasm of asthma will disappear.

Nervous Attacks, which may take the form of shivering fits, are to be treated by putting the patient to bed, if possible, and giving some hot coffee or hot sweetened water, and by applying heat to the body by means of a bath or hot cloths or bottles, with a mild mustard plaster or turpentine placed on the pit of the stomach. A teaspoonful of camphor water, of valerian, or of Hoffmann's anodyne will often prove of great service.

Toothache, depending upon a cavity in a decayed tooth, is usually very easy to stop. To do this a fine crochet-needle or a knitting-needle should have a *very small* bit of clean cotton twisted round its point, and with this the hole in the tooth should be thoroughly cleaned out. Then the point of the needle should be cleaned and another little ball of cotton, like a very small shot, should be dipped in oil of cloves and caught up with the end of the needle. It should then be laid in the hollow tooth and pushed in, not *too* hard, with the end of the needle. This rarely fails to cure such a toothache. Sometimes filling the cavity with baking soda, after cleaning it thoroughly, will stop the pain.

When toothache is not due to a hollow tooth, a somewhat severe, but usually efficient, plan of treatment is to lay between the gum and the cheek a

little wad of cotton, the size of the end of the thumb, soaked in spirits of camphor. This makes a sort of blister, but generally cures the toothache, which is much harder to bear. It can be used only by persons old enough to prefer the pain it causes to that of the tooth.

Earache should always suggest an examination of the teeth, and if one be found decayed, it may be extracted, or at least cleaned out and packed with cotton and oil of cloves, as described in speaking of toothache. Most earaches depend upon a diseased condition of the throat or back part of the nose, and these should always be investigated in case of earache.

For the pain of earache, a folded cloth, wrung out of hot water, with a teaspoonful of laudanum poured over it, or a big, hot poultice—for which hops is the best material—should be applied to the side of the head and kept as hot as possible. Hot drinks should be given also, and, if necessary, paregoric or laudanum to give relief from pain. It is a good plan to pour into the ear a few drops of sweet oil, quite hot (not hot enough to burn, of course), to which an equal part of laudanum has been added after the oil has been warmed.

The occurrence of an earache should always lead to consulting a doctor, for it is often of importance as a sign of disease which may seriously affect the hearing.

Poisoning by the common Poison Vine (Poison Ivy, see p. 126) causes red blotches, and wheals, and blisters on the skin, with great burning and itching. It is best treated by applying cloths soaked in a solution of baking soda—a tablespoonful to a teacupful of hot water. Dusting with magnesia or ordinary toilet powder is also grateful. Lead-water and laudanum (as sold in the drug stores) is often a good application.

Neuralgia of the Face may come on suddenly, when the advice of a physician cannot be obtained. In such a case the application of a hot cloth, wet or dry, may do much good, or painting the painful part lightly with oil of peppermint. On the other hand, cold applications may do more good, although this does not often happen.

Convulsions, from various causes, are to be treated as described on pages 37, 38.

Fever.—It often happens that children unexpectedly develop symptoms of fever when there is no physician at hand. In such cases it is well to know what may be done before medical advice can be obtained. The first thing to do is to get such a child undressed and to bed, and to give it all the cool water it desires to drink. Then a purge should be given, nothing being better than a mixture of equal parts of castor oil and spiced syrup of rhubarb, or a tenth of a grain of calomel every half hour until the bowels move freely, or ten doses have been taken.

At the same time a teaspoonful of sweet spirits of nitre may be put in a glassful of cool water, and a dessert-spoonful of this mixture may be given every fifteen minutes or half hour. This acts gently on the skin and kidneys, and often does much good.

A feverish child ought not to be covered up too warm in bed. It will not "take cold" if it is kept moderately cool, and it will be much more comfortable. Nature prompts persons in the heat of fever to get rid of most of their covers; and Nature is a safe guide in the treatment of disease.

For food, a feverish child should be given nothing but milk at first, and *nothing at all* if it does not want to eat. Coolness (not coldness, of course), plenty to drink, nothing to eat, and a good cleaning out of the bowels are the things most important for cases of simple fever. Many fevers disappear promptly under this treatment, and no case of serious fever is prejudiced by it.

Supplies for Emergencies.

The suggestions in the preceding pages have been, as far as practicable, such as could be carried out without having made any special provision for them. Nevertheless, occasionally appliances and remedies have been mentioned which would very much facilitate the treatment if they were accessible.

Emergency Case.

A surgical case suitable for almost any emergency should not contain so many things as to confuse one who has not a medical education. Its supplies should be few and simple, such as—

1. Absorbent cotton.
2. Roll of old muslin or linen and one of soft flannel.
3. Bandages, $2\frac{1}{2}$ inches wide and 6 yards long, rolled up.
4. Rubber adhesive plaster, on a spool, in a strip two inches wide.
5. Oiled silk (or paraffine paper).
6. Sharp scissors.
7. Pins (ordinary, and small safety pins).
8. Needles, threaded with stout thread.

9. Cosmoline or vaseline or albolene.
10. Alum—powdered.
11. Ammonia—aromatic spirits of.
12. Calomel.
13. Castor oil.
14. Cloves—oil of.
15. Epsom salts (sulphate of magnesia).
16. Iron sulphate.
17. Hartshorn.
18. Ipecac—syrup of.
19. Laudanum.
20. Lime-water.
21. Mustard.
22. Nitre, sweet spirits of.
23. Paregoric.
24. Rhubarb—spiced syrup of.
25. Soda—bicarbonate of.
26. Turpentine.
27. Whiskey.

Of medicines, a convenient quantity to have is two fluid-ounces; except in the case of oil of cloves, of which a fluid-drachm is plenty. Aromatic spirits of ammonia, and hartshorn, and the spirits of nitre ought always to be kept in bottles having good rubber or glass stoppers.

The laudanum and paregoric bottles, and that of hartshorn and the oil of cloves (because their contents are dangerous or irritating), should be marked "*Poison!*" and have a tape or small ball and chain

attached to their necks, so that it could be felt in the dark.

Each bottle should have its proper dose plainly printed or marked on the label.

For the convenience of readers of this book, the author has had made a case containing the remedies and appliances named above (except the old muslin).

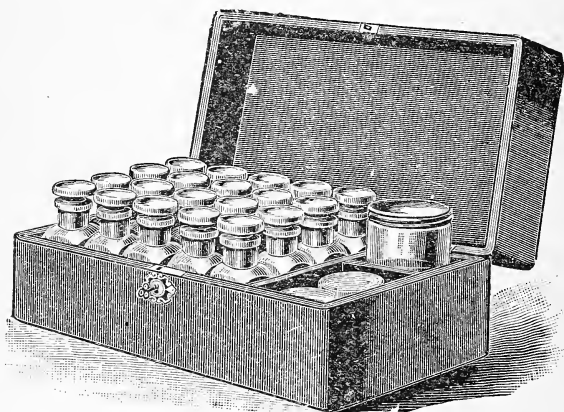


FIG. 27.

This case * (Fig. 27) is made of leather or hard wood polished, and measures $11\frac{1}{4} \times 7\frac{1}{4} \times 4\frac{3}{4}$ inches. It contains 20 two-ounce bottles with glass

* The Emergency Case, with contents, can be purchased of the E. A. Yarnall Co., 1020 Walnut Street, Philadelphia, for ten dollars.

stoppers, a glass jar for vaseline, and two spaces for surgical appliances. Several of the bottles are left unfilled for other articles which may be desired by the purchaser.

Use of the Emergency Case.

1. **Absorbent cotton** can be obtained at any drug store. It is perfectly clean and soft, and is prepared in such a way that it—instead of resisting moisture, as ordinary cotton does—will absorb fluids with great rapidity. Thus it will take up discharges from wounds; and when a cool or hot application is desired, it can be soaked with cool or hot water. Sometimes it is very convenient to put it on dry, and then to squeeze the water upon some part of it from a sponge, when every part will rapidly become saturated.*

For padding splints, or making cushions to prevent pressure of any kind, ordinary cotton is better than absorbent cotton.

2. **Old muslin** or linen can be torn into any shape or size that may be required, and can be used to spread poultices upon. It is also useful to make broad slings of.

* In buying absorbent cotton, it should always be tested. If good, a little pinch of it dropped on water will become wet and sink in a second or two. Cotton that floats dry on the surface is not fresh, and is not fit to be sold as absorbent cotton.

3. **Bandages** of the kind described are used to keep applications in place, to secure parts to splints, and to prevent injurious motion.

Roller bandages may be made of the following sizes, according to the part of the body for which they are required :

For the finger, $\frac{3}{4}$ inch wide and 1 yard long.

“ arm, $2\frac{1}{2}$ inches wide and 4 to 6 yards long.

“ leg, 3 inches wide and 6 to 8 yards long.

“ chest, 4 to 5 inches wide and 8 to 12 yards long.

“ head, $2\frac{1}{2}$ inches wide and 4 to 6 yards long.

The arm-size bandage is the one of most general usefulness, and the most convenient to have in an emergency case, if only one can be had.

The simplest way to apply a bandage is to make circular turns around any part. When the latter is of even size, this is a very easy matter. Where the part is larger at one end than the other, the ordinary circular turns would not fit smoothly. To accomplish this, the rule is to begin at the small end and make a few turns, round and round, one immediately over the other, and then to begin to move up the limb spirally. So long as a turn can be made to smoothly overlap the one before it about one-third, this spiral is all that is required. But as soon as it puckers, the bandage is not carried on as before, but is turned down, so that the inner face now looks out, and the bandage, instead of passing up, passes downward so as to make a sort of inverted V—so, Λ .

On now carrying the bandage round the part, it will be found that it comes to the front just overlapping the preceding turn, and the same process can be repeated until the whole bandage is neatly applied. (See Fig. 28.)

At joints, like the ankle, knee, and elbow, the bandage may make a sort of figure 8, the middle or crossing part being in the bend of the joint, and

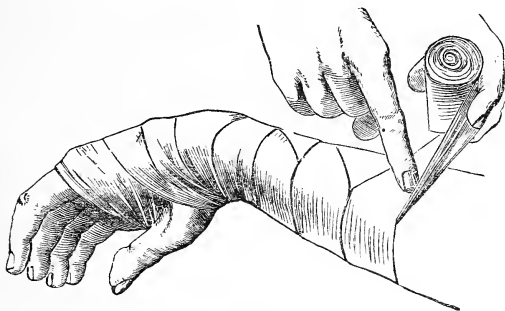


FIG. 28.

the two loops, one above and one below it. (See Fig. 29.)

Bandages should never be put on so tight as to cause pain, and should never be drawn tighter above than below.

Bandages may be fastened with pins, with strips of adhesive plaster, by stitching, or by splitting the end and carrying one tail on as before and turning the

other back to meet it and then tying the two together. For narrow bandages, the latter is the simplest plan ; for wide ones some one of the others is better.

The width of $2\frac{1}{2}$ inches is that which is oftenest convenient. When a narrower bandage is called for

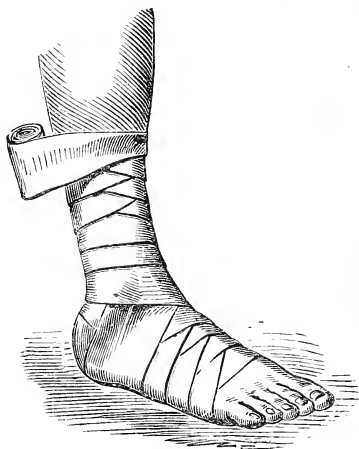


FIG. 29.

—as for a finger—one of the former may be torn down the middle ; or, if rolled up, it can be laid on a firm surface and the whole roller cut in half with a razor or a sharp knife, just as one would cut a sausage. This quickly and easily makes two good finger bandages.

4. **Rubber adhesive plaster** is better than any other kind, because it can be applied without heat or moisture. It sticks of itself. When it is to be applied to a hairy part, the hair should first be shaved off, if possible. If not, when the plaster comes to be removed, it must be soaked off or it will pull the hair out and cause great pain. Rubber plaster, if kept on long, may set up an eruption on the skin. This must be borne in mind, especially in summer and in the case of women and children.

Another point to be remembered is that, in changing adhesive-plaster dressings, only as much should be removed as is necessary or as cleanliness demands. The rest may be left on and the new dressing applied up to or over it. In the end all can be removed together.

The plaster is sold in strips on spools. These strips can easily be cut smaller; while additional strips may be applied side by side if a greater width is wanted.

5. **Oiled silk** or paraffine paper is used to retain heat and moisture after poultices or other warm wet dressings are applied.

6, 7, 8. **As to the use of scissors, pins, and needles**, it may be stated that the points of pins should never be left sticking out; and care should be used to avoid sticking either pins or needles through a patient's skin.

9. **Cosmoline**, and **vaseline**, and **albolene** are

excellent as applications to a variety of wounds or injuries, though each is somewhat irritating to the eye or the inside of the nose. As they never become rancid, they are preferable to cold cream for an emergency case.

10. **Alum** (in powder) added to water is useful for checking bleeding from the nose or some forms of internal hemorrhage. The dry powder (one quarter teaspoonful) is sometimes useful as an emetic for children in croup or whooping cough.

11. **Aromatic spirits of ammonia** is a valuable stimulant often recommended in the preceding pages. It is also useful in acid dyspepsia and nervous or sick headache, and simple nervousness. The dose is, for an adult, a teaspoonful, in about a wine-glassful of water; for a child, ten to thirty drops, in a tablespoonful of water. This may be given every fifteen minutes until four or five doses have been taken.

12. **Calomel** is admirable as a dusting powder for chafing or irritation of the skin, and given internally ($\frac{1}{10}$ grain every half hour until it acts, or until the bowels act freely) is one of the very best means of clearing out and putting in good shape the bowels.

13. **Castor oil** is a most excellent external application wherever an oily or greasy preparation is needed. Besides this, it is unquestionably one of the very best remedies for an incipient cold, and generally useful as a purge. For children (and

adults, too) it may be made less unpleasant, and in some respects improved in action, by the addition of an equal part of spiced syrup of rhubarb. A mixture of these two may be given without much trouble to almost any child. It will be found a little easier to give castor oil, alone or in combination, if it is warmed, and then given from a cup or spoon that has been heated.*

14. **Oil of cloves** is used chiefly to cure tooth-ache; but a few drops added to a teaspoonful of olive oil and rubbed into the skin will often relieve the pain of neuralgia in various parts of the body. It is also useful in indigestion, in doses of three drops for an adult and one drop for a child. This may be given rubbed up with a little sugar, or in a teaspoonful of sweet oil, or spiced syrup of rhubarb.

15, 16. The **Sulphate of iron** and the **Epsom salts** are included, because the former (with soda) is the best antidote for arsenical poison, and the latter is the best antidote for carbolic acid and sugar of lead (see p. 117).

17. **Hartshorn** is to be used as a stimulant to the heart and to the nervous system. A half teaspoonful may be put into a tumblerful of water and a table-

* The best way to give castor oil to adults is to warm a cup and squeeze half a lemon into it; then to pour on this a tablespoonful of warm and thin castor oil; then on this to squeeze the other half of the lemon. The patient may now put the lemon skin to his mouth and press a little juice out of it, and then swallow the dose. The most delicate women take oil in this way without finding it disagreeable.

spoonful of the mixture given every few minutes. Its use by inhalation everybody is familiar with. Yet it may be worth while to say that a bottle of hartshorn should never be brought near to a patient's face. The stopper may be wetted and held near the nose, or a few drops may be put on a handkerchief or the hand and used in the same way. It is sometimes very comforting to put a few drops on a handkerchief and fan over this toward a person who is very weak.

18. **Ipecac.**—The syrup of ipecac is a fairly good emetic. But it must be used freely. An adult should be given a good tablespoonful, and an infant as near a teaspoonful as possible. It will do no harm; and when an emetic is called for, it is no time to run any risk that the dose given may not be large enough. It is often usefully employed in cases of poisoning, convulsions, croup, whooping cough or asthma.

19. **Laudanum.**—Laudanum is the tincture of opium, and has all its properties. It is one of the most useful drugs in the world, and yet in foolish hands it is a dangerous one. There need be, however, no fear of poisoning with any preparation of opium if ordinary doses are given, and if these doses are not given closer together than half an hour, and if they are *stopped* as soon as pain is decidedly lessened or drowsiness comes on. Occasionally, small doses of opium cause great alarm; but there is much less fear now about opium poisoning among doctors than there used to be. It may be considered

safe to give thirty drops of laudanum to any adult when there is severe pain, and to repeat this dose every half hour until the pain is lessened or drowsiness begins to appear. One of the signs of the effect of opium on the system is a contraction of the pupil of the eye, which does not expand in the dark—the test being made by first shading both eyes, and then exposing them to a light. Persistent contraction of the pupil ought always to lead to a discontinuance of any preparation of opium that has been used.

To check diarrhœa, a drop of laudanum given every hour will sometimes prove successful very soon. Yet ten or fifteen drops may be given to an adult *after each movement* if the smaller quantity does not suffice.

For cuts and bruises there is no better application than pure laudanum. A soft cloth soaked in laudanum can be bound on, and occasionally wetted with it, without removal. It quiets pain and promotes healing. A similar application is often very soothing in face-ache, toothache, and earache, as well as in the pains of rheumatism and neuralgia.

20. **Lime-Water.**—Lime-water may be prepared at any time by putting a piece of lime as large as a small apple in a quart or two of water and allowing the mixture to stand for a few hours. The clear water may be poured off and bottled for use. In an emergency a piece of lime as large as a walnut may

be put in a half-pint bottle of water, and the whole well shaken for a minute or two. The water may be strained through a cloth or allowed to clear by settling, according to the degree of haste required.

Lime-water is used to settle sick stomachs, as an antidote to acid poisons, and in combination with sweet oil as an application to burned surfaces.

21. **Mustard.**—Ground mustard is useful in plasters and poultices. In plasters, it should be made weaker by the addition of flour—an equal part or more of the latter, as the plaster is to be stronger or weaker. In adding mustard to poultices, it should be first well mixed with water and then stirred into the poultice mass.

Mustard plasters often act quickly and must be removed in a few minutes, as soon as the skin is well reddened. Where it is desired to leave a mustard plaster on for more than a few minutes, it should be made of one part mustard to three or more of flour. Every mustard plaster should be removed as soon as the skin becomes red, and not allowed to make a blister, because such blisters are excessively painful and very hard to heal. Further, when mustard plasters are applied to persons who are more or less unconscious, or paralyzed, or of dull intellect, or very young, they must not be left on until the patient shows uneasiness. In such cases the attendant must

look at the skin soon and often, to prevent the occurrence of blistering.*

22. Nitre.—Sweet spirits of nitre is a most useful domestic remedy. A teaspoonful may be added to a tumblerful of water and a tablespoonful of the mixture given to an adult, or a dessertspoonful to a child of any age, every hour, in any feverish condition. This will tend to promote healthy activity of the skin and kidneys.

23. Paregoric.—Paregoric is an opium preparation which contains, besides opium and other things, some camphor. It is the best preparation for children, because the dose is easier to measure than that of laudanum. An infant a few hours old will stand three drops, and in a few days, five. In a month, ten are not too many, and twenty may be given any time after six months. At six years a teaspoonful may be given for pain, and an adult can take a tablespoonful. It may be used internally in all the cases for which laudanum has been recommended.

24. Rhubarb.—The spiced syrup of rhubarb is an excellent mild laxative for the bowels. A teaspoonful is the dose for an infant or small child. It

* **Red Pepper** may sometimes be used instead of mustard; though it is more energetic in its action. When moistened and applied to the skin, red pepper first causes a feeling of warmth, and later of intense, fiery burning. If left on long enough it will cause a blister. Red pepper well diluted with flour may be applied in cases of colic or cholera morbus, where it quiets pain by its counter-irritant effect, and stimulates the nervous and circulatory systems. In nausea it sometimes does good by the latter process.

is useful at the beginning of a diarrhœa in children, as it empties the bowels of what irritates them, and also has a soothing and healing influence. The use in combination with castor oil has been described above.

25. Soda.—Bicarbonate of soda (baking soda) is useful as an application to burns, as an antidote to acid poisons, and for heartburn. For the latter the dose is as much as will stand on a silver ten-cent piece dissolved in a tablespoonful of water.

26. Turpentine.—Spirits, or oil, of turpentine may be used wherever mustard has been recommended as an external application. For this purpose a soft flannel or muslin cloth should be dipped in turpentine, wrung out nearly dry, laid on the surface, and covered with oiled silk or a few thicknesses of dry cloth, to prevent evaporation.

A milder form of application is what is called a "turpentine stupe." This is prepared by sprinkling a tablespoonful of turpentine over a flannel cloth (folded to several thicknesses) and wrung out of hot water. It is in some respects better to stir the turpentine into a pint of hot water, and then to saturate the cloth with it.

Turpentine is also useful as an antidote to phosphorus poisoning.

27. Whiskey for medicinal use should be of the very best quality. It should always be used in small doses—a teaspoonful for an adult—in hot water, fre-

quently repeated. Children rarely need it ; but in collapse a dose of fifteen drops, with water, is not too much or too little for any child.

How to Make Poultices.

Poultices.—The commonest materials for poultices are hops, bread, flaxseed, and corn meal. A hop poultice is made by pouring hot water upon hops until they are well moistened. A bread poultice is made by soaking the inside of bread in hot water or milk, and mashing it quite soft and even. With flaxseed or corn meal the way is to have a vessel containing hot water and to pour into it flaxseed meal or corn meal, constantly stirring, until the mixture is as thick as porridge, almost (but not quite) soft enough to run. Poultices should be spread about half an inch thick. To spread a poultice, a piece of fine old muslin (or a piece of open-meshed stuff, such as ordinary cheesecloth), twice as long as the poultice is to be, is laid on a flat surface, and the middle of it spread smooth with the poultice material. The two ends are then brought over and pressed down on top of the poultice material ; or another piece of muslin or a piece of tarlatan can be used for this purpose, so that the poultice material shall not come into immediate contact with the skin ; then, when it comes to be removed, it will come off easily, all at one time, and not leave any behind to stick to the skin.

A poultice must be put on hot. To insure this, it may be spread upon a hot plate. A simpler plan, however, is to take the finished poultice up by its edges and lay it for a moment or two on something hot, or to dip it into a vessel containing boiling water. Care must be taken not to put on a poultice so hot as to burn.

To keep a poultice warm when applied, it should be covered with oiled silk or a folded towel.

Signs of Death.

In the absence of a physician it sometimes becomes important that others shall be able to determine whether death has taken place or not. The occurrence of death can be recognized by the following signs: The breathing and pulse cease, the surface becomes pale, the muscles relax, the lower jaw falls a little, the "sight" of the eye becomes dull and glazed, the upper lid falls so as to partly cover the eyeball, then the whole body gradually cools to the temperature of the surrounding air and becomes rigid, while, later, decomposition sets in, and usually shows itself first by a greenish discoloration of the surface of the abdomen.

But it does not require the detection of all these signs to determine that death has taken place. The cessation of breathing and of the heart-beat is a safe basis for an opinion. It requires some care, however, to decide that there is no breathing or circulation. To test the former, a cold piece of polished steel—like a razor blade or table knife—can be held under the nose and before the mouth. If no moisture condenses upon it, it is safe to say there is no breathing. To test the cessation of the heart-beat, it is

not enough to feel for the pulse at the wrist. The largest blood-vessel in the body (see Frontispiece) runs directly down from the heart, along the left side of the spinal column, and its strong beating can be plainly felt in most people by pressing the finger tips firmly down toward the backbone, at the point below the breast-bone called the "pit of the stomach." In this place the slightest pulsation of the heart can be felt if the walls of the abdomen are slack enough to permit the finger to get near the backbone; and here examination should be made before deciding that the heart has ceased to beat. Another test is listening over the region of the heart, in front of the left side of the chest. An acute ear can always detect the movement of the heart by sounds made by its valves, which, when perfect, sound like the syllables "ub-dup," "ub-dup," and so on. If on careful listening the heart-sounds can not be heard, and the cold metal fails to show any evidence of breathing, the individual may certainly be said to be dead.

When, in addition to these signs, paleness, muscular relaxation, a glazing eye, increasing coldness, and then rigidity come on, it hardly requires the onset of decomposition—the infallible sign—to prove that death has occurred.

The electrical battery may be used in doubtful cases. Electricity distinguishes with absolute certainty between life and death. Within two or three hours after the stopping of the heart the whole of the

muscles of the body will have completely lost their electric excitability. When stimulated by electricity, they no longer contract. If, then, when electricity is applied to the muscles of the face, limbs, or trunk, after supposed death, there is no contraction, death has occurred. No faint, no trance, no stupor, however deep, can prevent the manifestation of electric muscular contractility.

The modern method of preparing bodies for burial by "embalming" is a sure preventive of mistakes; because, if the subject were not dead when the process of embalming was begun, he would be killed by it.

But ordinarily it is very easy to decide between death and life; and the fear of being buried alive, which torments many people, is altogether without good foundation. The stories upon which it rests are such as an excited imagination might easily invent, and natural fear propagate, but they do not bear critical investigation. In certain European cities, for many years, the bodies of hundreds of thousands of those supposed to be dead have been placed in rooms where ingenious appliances and careful watching have been used to detect the slightest evidence of life, and in *not a single case* has a mistake been found to have been made.

A review in the *British Medical Journal*, January 9, 1897, ridicules the danger of burial alive by saying that the book reviewed, and written to prove the

danger, cites in 400 pages only one case reported in England, and that occurred over a century and a half ago.

I have for years investigated cases in which it has been reported in the newspapers that persons had been buried alive; and in every case in which I could get any information from a trustworthy source the story has been found to be absolutely false.

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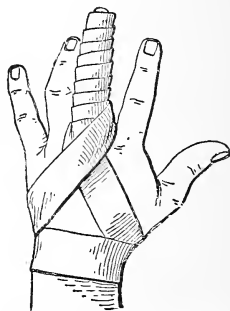
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